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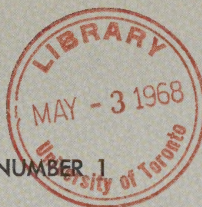
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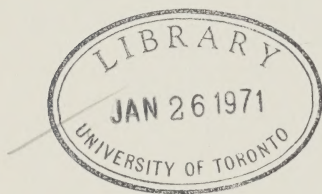
APRIL 1968

CANADIAN FARM ECONOMICS

Commodity Review.....	1
Possibilities for Farm Development in Southeastern Renfrew County, Ontario.....	J. H. Lovering 8
The Probable Effects of the Application for Railway Branch Line Abandonment on the Grain Elevator Industry.....	D. Zasada 20
Egg Wholesaling in Canada.....	J. D. Kidd 24
Policy and Administration of Public Lands in British Columbia with Particular Reference to Agriculture R. A. Stult	29
Policy and Program Developments.....	32
Publications.....	32
Statistical Appendix.....	34

HON. J. J. GREENE, MINISTER—S. B. WILLIAMS, DEPUTY MINISTER

CANADIAN FARM ECONOMICS is published bi-monthly by The Economics Branch, Canada Department of Agriculture, Ottawa. Its purpose is to provide farmers, research and extension workers, government administrators and agri-business organizations with information on current economic developments in Canadian agriculture. Articles or other material appearing herein may be reproduced without permission provided credit is given to the source.



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CANADIAN FARM ECONOMICS

COMMODITY REVIEW

CONTINUOUS EXPANSION IN CATTLE FEEDING

Increased Production

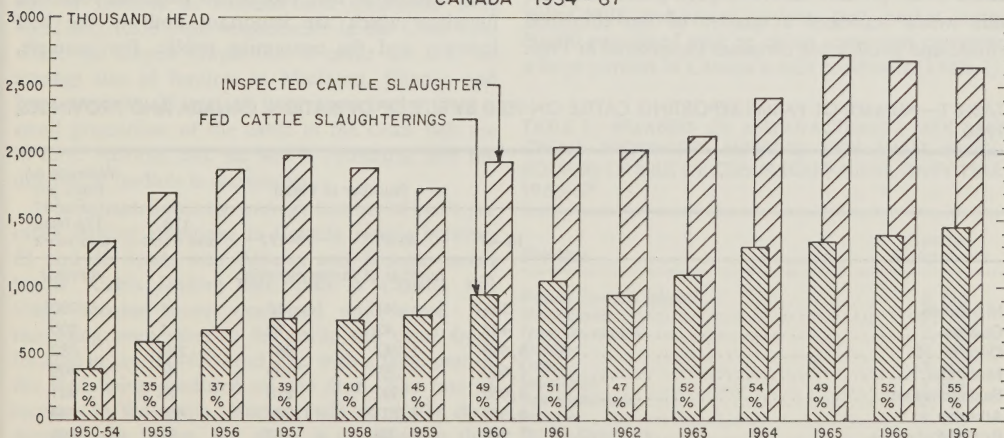
Since the early 1950's the cattle feeding industry in Canada has been undergoing almost continuous expansion. Slaughtering of fed cattle increased nearly fourfold from an annual average of 398.6 thousand head during 1950-54 (29 per cent of inspected slaughter), to nearly 1.5 million head (55 per cent of total slaughter) in 1967 (Figure 1). There have been only two years since 1950 in which slaughtering of fed cattle have not increased over the previous year. The years were 1958 and 1962 when slight decreases occurred. The decline in 1958 reflects in part the cyclical nature of cattle production (Figure 2). Poor crop and pasture conditions resulting from adverse weather in 1961 contributed to the decrease in 1962. However, Figure 1 illustrates that cattle feeding has expanded rapidly since the down phase in the cattle numbers cycle of the late 1950's.

In 1965, total cattle numbers on farms in Canada reached a record high after seven consecutive years of increase. During 1966 and again in 1967, cattle numbers on farms decreased and total federally inspected cattle slaughter also decreased. On the other hand, fed cattle slaughter continued to increase and between 1965 and 1967 increased 8.2 per cent. For the first two months of 1968, choice and good grade carcasses combined, accounted for 56 per cent of total inspected slaughter.

Location of Cattle Feeding

Prior to the 1950's, the production of slaughter cattle was more widely and evenly distributed throughout the nation. An important reason for this is that cattle are well adapted to utilization of grass, hay and other forages. While these traditional fundamentals are still important in beef production throughout Canada, feedlot feeding in many areas has expanded rapidly.

FED CATTLE SLAUGHTERINGS* AS A PERCENT OF TOTAL INSPECTED CATTLE SLAUGHTER
CANADA 1954 - 67



* For this chart, Fed Cattle Slaughtering are those cattle which grade choice or good.

FIGURE 1

CATTLE ON FARMS, 1935 - 1966

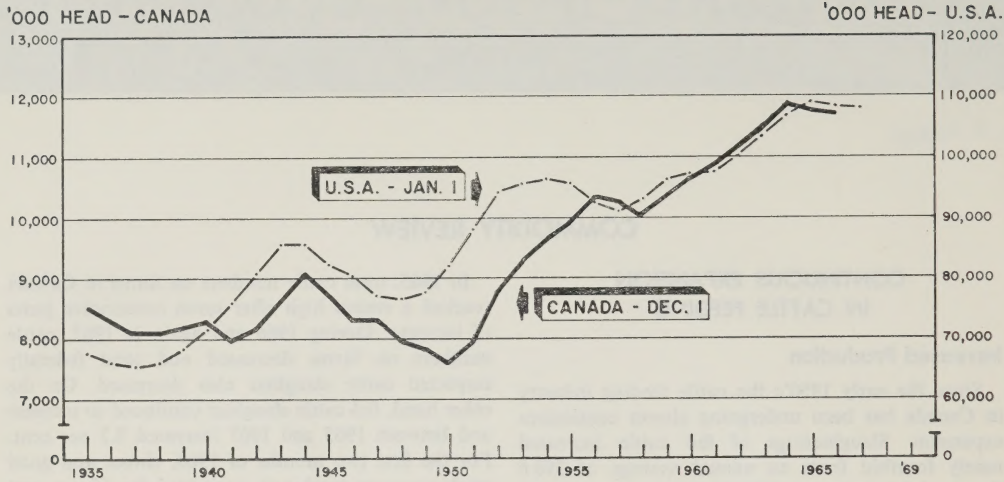


FIGURE 2

The 1966 census reveals that cattle feeding is a well established part of the agriculture industry in Canada. The greatest concentration of cattle feeders was in Western Canada (Table 1). In terms of the number of farms reporting cattle on feed, the largest numerical concentrations were in Alberta and Ontario. A total of 922 farms in Canada reported 178 head or more cattle on feed, all but 152 of the farms were in Alberta and Ontario. Of the 922 farms reporting 178 head and over, the number of cattle on feed per farm averaged 373 head. This represented a total of 343,906 head. Under the assumption that these cattle would produce choice or good grade carcasses, this would represent a quarter of the combined choice and good grade carcasses slaughtered in 1966.

Economic Importance of Feedlot Feeding

Increasing population has combined with a rising level of consumers' incomes, enabling consumers to exercise an increasing preference for beef. Present annual per capita consumption of around 83 pounds of beef compared with 66 in 1959, attests to the importance and acceptance of beef in Canadian diets. This level of consumption could not have been achieved without many changes that have taken place in the beef industry.

One of the important changes has been the rising proportion of cattle placed in feedlots before slaughter. This method of beef production performs economic functions which are important both to the beef industry and the consuming public. For example,

TABLE 1—NUMBER OF FARMS REPORTING CATTLE ON FEED BY SIZE OF OPERATION, CANADA AND PROVINCES, 1966

	Number of Head				Average on Feed per Farm 178 head and more
	18-47	48-77	78-177	178 and more	
	number of farms reporting				number
Maritimes.....	365	41	17	1	260
Quebec.....	467	43	19	1	200
Ontario.....	5,669	1,247	883	284	332
Manitoba.....	1,660	249	129	44	409
Saskatchewan.....	4,062	562	278	75	431
Alberta.....	5,561	1,703	1,282	486	384
British Columbia.....	247	68	57	31	396
Canada.....	18,031	3,913	2,665	922	373

Source: Dominion Bureau of Statistics, *Census of Agriculture, 1966*.

(1) feeding produces more beef from a given cattle inventory, (2) the combination of cow-calf herds and feedlot finishing is a joint effort between different areas which permits more efficient use of resources, (3) feeding improves the quality of beef and (4) feedlot feeding produces a more uniform quality and year-round supply of fed cattle for slaughter. In each quarter of the year, slaughterings of choice and good grade carcasses combined approximate 25 per cent of the annual slaughter of these grades.

Feedlot feeding also tends to reduce the land area required and improves the ability of beef production to compete with other intensive enterprises.

Future Implications

Looking into the future, it is likely that the bulk of the increases in cattle feeding will be in Ontario and Western Canada, particularly Alberta. The natural advantage of Ontario farmers in corn production plus Ontario's proximity to eastern population centers provides a marketing and price advantage over most other areas of Canada. Ontario has no serious disadvantage in competing for the available supply of Western feeder cattle since it costs about the same to move a 600 pound feeder from Calgary to Western Ontario as it costs to ship a dressed carcass. On the other hand, the nearness of Western farmers to the main source of feeder cattle gives them a strong competitive advantage in the production of fed beef. Also, the complementary feed-livestock relationships found in many areas of the Prairie Provinces is a further inducement to livestock production.

The average size of Canada's cattle feeding enterprises is small relative to some Western States in the United States. As of January 1, 1967, the average size of feedlots in Arizona and California were 4,252 and 1,853 head respectively. In the Corn Belt, where the largest proportion of cattle are fed, the average size of feedlots in Michigan, Illinois, and Iowa were 95, 28 and 44 head respectively. Only a small proportion of the cattle in the Corn Belt are in large feedlots, but the size is increasing and the number of feedlots is decreasing.

It is estimated that the average number of cattle per cattle feeding enterprise in Canada ranges between 25 and 30 head, with Alberta and Ontario much higher. Cattle feeding enterprises in Canada will likely become more specialized and larger. An increasing proportion of fed cattle will come from feedlots in the 100-400 head size, with a large part of the feed being produced on the farm. The rate of increase in fed cattle slaughter will no doubt slow down in the future, but there is no evidence that slowing down has begun.

A. M. Boswell

CANADIAN DAIRY COMMISSION ESTABLISHES MINIMUM DAIRY SUBSIDY QUOTAS

The Canadian Dairy Commission took another step towards rationalizing the dairy industry when it announced on January 15, 1968, that for the dairy support year, beginning April 1, 1968, farmers who shipped less than 12,000 pounds of milk or 420 pounds of butterfat between April 1, 1967 and March 31, 1968, will not be eligible for federal dairy subsidy quotas. A quota is defined as the amount of milk or cream on which federal subsidies are paid and is equal to the producer's reported deliveries during the previous year.

The Commission's decision to set the minimum quota at 12,000 pounds was a modification of an earlier announcement that only those farmers shipping 50,000 pounds of milk or butterfat equivalent in the 1967-68 dairy year would be eligible to receive quotas in 1968-69. The modification was made at the request of farm organizations, who emphasized the difficulties that many farmers would undergo if the original intentions of the Commission were carried out this year.

Farmers who deliver between 12,000 and 50,000 pounds of milk, or the equivalent in cream, in the 1967-68 dairy year will be eligible for subsidy quotas in 1968-69 if they are full-time farmers and milk and cream represents a major part of their farming operations. Those eligible will receive a subsidy quota equal to the amount of their reported deliveries in 1967-68. Quotas are only related to the federal subsidy payments and do not restrict the amount of milk that a farmer can sell on the market.

The Commission is attempting to assist farmers in the lower volume group to develop larger production units. Milk and cream shippers that market under 50,000 pounds of milk or cream equivalent represent a large portion of Canada's milk producers (Table 1).

TABLE 1—NUMBERS OF MANUFACTURING MILK AND CREAM PRODUCERS SHIPPING LESS THAN 50,000 POUNDS OF MILK OR CREAM EQUIVALENT, DAIRY YEAR 1966-67

Province	Number of Producers
Prince Edward Island.....	2,710
Nova Scotia.....	2,272
New Brunswick.....	2,483
Quebec.....	20,444
Ontario.....	13,810
Manitoba.....	13,689
Saskatchewan.....	22,217
Alberta.....	18,952
British Columbia.....	669
Canada.....	97,246

Source: Canadian Dairy Commission.

It is expected that about 6,000 producers who shipped less than 50,000 pounds of milk or 1,750 pounds of butterfat during the 1966-67 dairy year will exceed that volume in 1967-68.

Although the methods may differ, the aims of farmers and governments in all the main dairy countries of the world are for a more efficient dairy industry. This is being accomplished by diverse means such as increases in productivity through genetic improvement and disease control, changes in feeding practices, improved pasture management, changes in harvesting techniques, improved farm equipment and changes in marketing and transportation structures. In the United Kingdom and Denmark, for example, 90 per cent or more of the farmers keeping dairy cows have milking machines, but in Canada less than half the dairy herds are milked by machine. Canada, however, was among the leaders in adopting the bulk method of handling milk—this occurred mainly in the large fluid milk producing areas.

Although Canada has many large dairy herds, consisting of some of the finest animals to be found anywhere in the world, there are also a large number of farmers with small herds. Since there is such a discrepancy between the average yield per cow in many of the good dairy herds and the national average production, many of the small herds must contain some very low producing cows. It is not uncommon for fluid milk producers to have herds that average from 12,000 to 14,000 pounds of milk per cow per year, while the Canadian average is around 6,800 pounds.

Many of the main milk producing countries of the world have larger average milk yields than Canada. The average annual yield per cow in 1965 in the Netherlands was 9,260 pounds; Denmark, 8,704; Belgium, 8,518; United Kingdom, 8,333; United States, 8,302; West Germany, 8,034; Sweden, 8,024; Switzerland; 7,416 and Finland, 7,344 pounds.

The 1966 Census figures show that 47 per cent of the farms reporting milk cows maintained herds of 1 to 7 cows (Table 2). Some of these farms produce sufficient milk for farm-home consumption and sell small quantities for a few months during the flush pasture season. Others, particularly in the three Prairie Provinces, raise a veal calf and after the calf is marketed, send farm-separated cream to a manufacturing plant. Some producers of cheese milk in Ontario and Quebec also raise veal calves before the cheese factories open.

The farm value of milk consumed in farm homes in 1966 amounted to about \$24 million and milk fed to livestock, including skim milk, to \$47 million, making a total of \$71 million.

Other farmers, by combining milk production with a number of farm enterprises, such as steers,

TABLE 2—NUMBERS OF FARMS BY HERD SIZE, CANADA, 1956-1966

	1956	1961	1966
	numbers		
Total farms reporting.....	398,604	308,980	221,850
Milk cows			
1 cow.....	55,290	34,535	26,511
2 cows.....	46,019	30,821	20,938
3 - 7 cows.....	135,662	95,904	55,997
8 - 12 cows.....	83,972	64,595	39,006
13 - 17 cows.....	39,692	36,519	26,529
18 - 32 cows.....	32,799	37,866	38,636
33 - 47 cows.....	3,964	6,424	10,002
48 - 62 cows.....	823	1,522	2,786
63 - 77 cows.....	220	422	788
78 - 92 cows.....	92	180	327
93 cows and over.....	71	192	330

Source: Dominion Bureau of Statistics, *Census of Canada*.

hogs, poultry and cash crops, are able to use their land and labor resources to the fullest, thus operating a fairly economic unit.

There are, however, a number of part-time farmers who earn a considerable portion of their income off the farm. According to the Economics Branch of the Canada Department of Agriculture, the average number of days worked off the farm in 1966 by manufacturing milk and cream shippers, based on replies from correspondents in a study, was 32 days. The highest number of days worked was in British Columbia at 72 days and the lowest in Saskatchewan at 11 days. The farmers who milked one to seven cows spent the greatest number of days in off-farm employment (Table 3).

TABLE 3—OFF-FARM EMPLOYMENT OF MANUFACTURING MILK AND CREAM SHIPPERS ACCORDING TO NUMBERS OF COWS MILKED, CANADA, 1966

Number of Cows Milked	Number of Days of Off-Farm Employment
1 - 7 cows.....	38
8 - 17 cows.....	33
18 - 25 cows.....	23
26 - 50 cows.....	15
51 - 100 cows.....	11

Source: Economics Branch, Canada Department of Agriculture

The objectives of government policies in a number of milk producing countries are aimed at achieving a balance between resources and their utilization. The United Kingdom has a two-price system—a guaranteed price exists for a standard quantity of milk and any excess is paid for at the market price. The standard quantity is tied to the fluid milk and cream sales (which account for from 72 to 75 per

cent of the total milk marketings) plus a reserve of about 25 per cent. The market price for excess milk is much less than that for the fluid trade. The dairy policy in Finland is very similar. Prices are guaranteed for a quantity of milk, based on the previous year's marketings, and amounts in excess of these quantities must be sold at the market price. In most countries—Canada and the United States are exceptions—there is a standard price for milk of a standard quality, irrespective of its utilization.

The Commission is placing emphasis on the intermediate range in the size of the dairy herd and is encouraging all methods which will aid productivity, with the goal of reducing the industry's dependence on subsidies.

The Commission also intends to raise the quality standards of milk and dairy products. It intends to establish a pilot program in the 1968-69 dairy support year for the purpose of improving quality standards of milk and cream. The findings of this project will most likely result in future subsidy payments being related to milk quality.

V. McCormick

FOREIGN TRADE IN POULTS AND TURKEY HATCHING EGGS

Canadian exports of poults and turkey hatching eggs have increased very rapidly since 1964, the first year for which federal government export statistics on this trade were available. In the January to September period of 1967, exports of poults and hatching eggs in terms of poult equivalents totaled 4 million, more than five times the volume of exports of poult equivalents in 1964. On the other hand, imports of poults and hatching eggs during the first nine months of 1967 totaled 3.8 million poult equivalents, down sharply from the record volume of imports in 1966. For the first time in the history of Canada's turkey industry, the overall trade position in poults and hatching eggs was very close to being in balance in 1967.

Recent trends in Canada's foreign trade in poults and hatching eggs are contained in the statistics of the Canada Department of Agriculture's quarterly Hatchery Outlook and in the Dominion Bureau of Statistics' monthly Trade of Canada reports of imports and exports. In the case of Trade of Canada, poult exports are included in an item called "live poultry, not elsewhere specified" while turkey hatching egg imports and exports are included with trade statistics of chicken eggs. Prior to 1962, poult imports were included along with chick imports in Trade of Canada. Because of these limitations of statistics in Trade of Canada, the Poultry Division extended their coverage of foreign trade in hatching eggs,

chicks and poults, and these are published quarterly in considerable detail in the Hatchery Outlook. Trade statistics on poults and turkey hatching eggs from both sources are shown in Tables 1 and 2. It should be noted that poult import statistics in Trade of Canada have been consistently higher than the totals shown in the Hatchery Outlook. This is due to the fact that the statistics in the Hatchery Outlook are derived entirely from reports of hatcheries that are registered with the Canada Department of Agriculture whereas Trade of Canada statistics are derived from reports of all foreign trade. In this case, the difference represents the volume of poult imports that are made directly by turkey growers.

In contrast with poult exports which are entirely of commercial stocks, poult imports are about two thirds of commercial stocks and about one third of breeding stock. Most of the commercial poults are imported into British Columbia and to a lesser extent into the Prairie Provinces, while the breeder stocks are imported by hatcheries in Ontario and Western Canada. Practically all of the poult exports originate in Ontario.

Similarly, hatching egg imports also consist of commercial and breeder stocks, but in the proportion of about 85 per cent commercial and 15 per cent breeder eggs. All of these originate in the United States, as is also the case with poult imports. Hatching egg imports in the January-September period of 1967 at 5.7 million eggs were moderately below the corresponding level in 1966, but moderately above the average volume of imports from 1963 to 1965. The majority of these commercial eggs are imported by Ontario hatcheries, and many of the poults therefrom are exported to the United States.

Most of Canada's hatching egg exports of 3.2 million eggs in the first nine months of 1967 originated in Ontario and British Columbia. An increased volume of exports from both these provinces accounts for the upward trend in exports since 1964.

Practically all of the Canadian turkey hatcheries have franchised with U.S. breeders to produce and distribute their strains. Most hatcheries have affiliations with their counterparts in the United States with whom they trade in commercial hatching eggs on a seasonal basis. The seasonal influence accounts for a large part of the two way trade between Canada and the United States in commercial hatching eggs. Import duties at a token $3\frac{1}{2}\text{¢}$ per dozen are the same both ways.

In the case of poults, Canadian hatcheries have some advantage over U.S. hatcheries in the matter of trade. For example, in Canada the combined effect of duty and exchange of $12\frac{1}{2}$ and 9 per cent respectively raises import costs by 13¢ on the cost of a 60¢ poult in the U.S. This is the maximum margin of

TABLE 1—CANADIAN EXPORTS AND IMPORTS OF POULTS, 1962 TO SEPTEMBER, 1967

	Exports		Imports	
	Trade of Canada ^a	Hatchery Outlook	Trade of Canada	Hatchery Outlook
	thousands			
Jan.—Sept. 1967.....	1,958	2,202	596	511
Jan.—Sept. 1966.....	1,023	1,090	913	720
1966.....	1,106	1,136	940	744
1965.....	542	528	635	517
1964.....	236	210	598	608
1963.....	188	^b	375	357
1962.....	50	^b	542	572

^aLive poultry not elsewhere specified.^bNot reported in the Hatchery Outlook.Sources: 1. Dominion Bureau of Statistics, *Trade of Canada*, Cat. No. 65-201.2. Canada Department of Agriculture, *Hatchery Outlook*.

TABLE 2—CANADIAN EXPORTS AND IMPORTS OF POULTS, TURKEY HATCHING EGGS AND TOTAL POULT EQUIVALENTS, 1962 TO SEPTEMBER, 1967

	Exports				Imports			
	Poults	Hatching Eggs		Total Poult Equiv- alents	Poults	Hatching Eggs		Total Poult Equiv- alents
		Eggs	Poult Equiv- alents			Eggs	Poult Equiv- alents	
thousands								
Jan.--Sept. 1967.....	2,202	3,177	1,811	4,013	596	5,676	3,235	3,831
Jan.--Sept. 1966.....	1,090	2,851	1,625	2,715	913	6,853	3,906	4,819
1966.....	1,136	3,228	1,840	2,976	940	7,809	4,451	5,391
1965.....	528	1,526	870	1,398	635	5,269	3,003	3,638
1964.....	210	931	531	741	598	5,745	3,275	3,873
1963.....	^a	^a	—	—	375	5,231	2,982	3,357
1962.....	^a	^a	—	—	542	5,765	3,286	3,828

^aNot reported in the *Hatchery Outlook*.

exchange and duty protection in relation to the U.S. poult price. This situation exists in Western Canada where hatcheries do not export poults. In Ontario, a poult exporting province, the poult price is presumably set by the U.S. price less 2¢ each for U.S. duty plus 9 per cent for exchange. This would result in a 63¢ poult price in Ontario compared with a level of 60¢ in the U.S.. These prices represent the theoretical range of prices within which Canadian poult prices may fluctuate in relation to U.S. poult prices.

J. D. Kidd

TOMATOES—CARLOT UNLOADS—TORONTO

Information on imports of fresh fruit and vegetables into Canada by city, is not readily available from the usual source of external trade statistics, the Dominion Bureau of Statistics. Statistics of receipts by rail, truck and boat of each kind of fruit and vegetable unloaded in twelve major Canadian markets,

expressed in carlot equivalents are published by the Markets Information Section, Production and Marketing Branch, Canada Department of Agriculture. This compilation includes domestic and imported commodities and provides data about tomatoes entering the Toronto distribution system in the spring of the year.

During April, May and June the Toronto market receives tomatoes from three main sources, Florida, Mexico and Ontario. Florida and Mexico supplied about equal amounts, on the average, over the past five years (Table 1).

During the five years, 1958 to 1962, these two sources shared the market, sometimes substantially, with California, Texas, Ohio, the Bahamas and Cuba. In 1958 and 1959 Ontario greenhouse tomatoes held about 7 per cent of the market.

During May and June of 1958 the Toronto market imported 270 cars of Mexican tomatoes. Since that time, with the exception of 1960, the trend has been

TABLE 1—TOMATOES, CARLOT UNLOADS AT TORONTO, FIVE-YEAR AND TEN-YEAR AVERAGES FOR THE MONTHS OF APRIL, MAY AND JUNE, 1958-67

Origin	10 year Average	1958-62 Average	1963-67 Average	Per Cent Change 1958-62 to 1963-67
	number			
Ontario.....	94	62	126	+103
Florida.....	117	81	153	+ 88
Mexico.....	179	204	155	- 22

downward. Unloadings of tomatoes from Mexico in 1967 were only about 60 per cent of the 1958 unloadings from that country.

During the five-year period 1958-62, Mexico was the greatest single supplier of imported tomatoes for the Toronto market. During those years there was a yearly average of 204 cars unloaded from that country, and absorbed into the Toronto distribution system. This represented about 40 per cent of the imported tomatoes. Florida the next largest single source of imports supplied 16 per cent during 1958-62.

The numerical positions of the two main sources of imported tomatoes did not change in the next five years, 1963-67, but Mexico barely held the lead. Imports from Mexico into Toronto dropped 22 per cent, on the average, between the two five-year periods and Florida unloads increased 88 per cent. During that time Ontario more than doubled its marketings.

In 1967 Ontario unloads on the Toronto market were slightly above the five-year average, but about 12 per cent below the year before.

In the same year, Florida tomato unloads were slightly above the five-year average and were 18 per cent greater than in 1966.

Unloads of Mexican tomatoes during 1967 were below the 1963-67 average. They were 8 per cent below those for 1966 and considerably below the 1958-62 average.

The monthly average carlot unloads shown in Table 2 give additional perspective to the Toronto tomato marketings during April, May and June.

Mexico was the dominant source of imported tomatoes during April in the 1958-62 period. No supplies from that source were received in June. The relative position of Mexico and Florida during April changed considerably in the next five-year period. Mexican tomatoes as a percentage of total imports decreased from 87 per cent to 70 per cent while Florida tomatoes increased from about 10 per cent to 28 per cent.

TABLE 2—TOMATOES—TORONTO, MONTHLY AVERAGE CARLOT UNLOADS, APRIL, MAY, JUNE, 1958-62 AND 1963-67

Origin	Period	April	May	June	Average (3 months)
		number			
Ontario.....	1963-67	5	44	77	42
	1958-62	3	22	37	20
Florida.....	1963-67	37	76	40	51
	1958-62	16	46	19	27
Mexico.....	1963-67	91	50	14	51
	1958-62	134	70	^a	68
All imports...	1963-67	130	131	104	122
	1958-62	153	189	161	168

^a 3 cars only in 1960.

A comparison of the two five-year periods for May, shows the Mexican share increased 1 per cent but carlot unloads of tomatoes from Florida rose from 24 per cent to 58 per cent. Florida marketed 26 cars more a month on the average than Mexico.

For June the picture was again different. During the 1958-62 period, with the exception of three cars in 1960, no tomatoes were imported from Mexico. During 1963-67 an average of 14 cars a month arrived. Florida's position changed again. It's share of the total imported unloads rose 3 times from nearly 12 per cent to 37 per cent. In the meantime Ontario greenhouse marketings increased considerably, rising from 37 to 77 carlot unloads.

On the basis of the five-year averages the following conclusions may be drawn:

The Ontario greenhouse tomato industry has increased its share of the total market from about 4 per cent in 1958 to an average of 25 per cent during the 1963-67 period. It has done this while the total market decreased 13 per cent. Unloads during the three-month period decreased from an average of 188 cars to 164 cars, during the past five years. Ontario has taken part of the market from Mexico and from a number of other sources.

While Ontario producers have made substantial gains on the Toronto market so have the Florida producers. Their share of the Toronto market rose from 5.6 per cent in 1958 to 31 per cent in the five-year period ending 1967. During April, May, and June, 1967, Ontario's share of the Toronto market remained approximately the same while Florida increased its share and Mexico's share decreased.

J. R. Burns

POSSIBILITIES FOR FARM DEVELOPMENT IN SOUTHEASTERN RENFREW COUNTY, ONTARIO

J. H. Lovering

The study from which this paper is derived (1) was undertaken in response to general concern about low farm incomes in eastern Canada. Its purpose was to investigate the changes in farmers' incomes that would likely occur as a result of various adjustments in existing farm businesses. Economic theory and experience in other farming areas led to the hypotheses that net incomes would be substantially increased if more intensive farming practices were adopted, and business size increased.

Farms were classified on the basis of the similarities of their estimated income response to new capital. A benchmark farm was established for each class of farms. Linear programming analyses based on these benchmarks were used to choose the more profitable farm enterprises from a range of possibilities that was wide both in terms of kind and intensity. Various farm organizations were compared in terms of labor incomes. Differences between the farm organizations resulting from the programming analyses and the benchmark farms indicated the nature of development possibilities.

STUDY AREA

The seven townships under consideration (Admaston, Bagot, Blythfield, Brougham, Grattan, Horton and McNab) make up a 570 square mile area extending south and west from the Ottawa River. The area is about 40 miles west of Ottawa.

Five approximately parallel faults, trending north-west to southeast give rise to a series of uplands and lowlands. The lowland adjacent to the Ottawa River has an accumulation of marine or lacustrine clays, and may be called the Ottawa Lowland. The southern boundary of the Ottawa Lowland is approximately coincident with the Pakenham Fault. The area south of this fault has little clay accumulation and is part of the Precambrian Shield (Figure 1).

The Ottawa Lowland is of low relief, lying between 250 and 600 feet above sea level. Imperfectly drained soils developed in the marine or lacustrine deposits predominate. Along the boundary between the Precambrian Shield and the Lowland, however, well-drained gravelly and sandy loams, and clay-sand complexes form an interrupted belt of varying width. The clay and clay-sand complex soils in the Lowland are the best soils for agriculture in the study area (2).

The Precambrian Shield section ranges in altitude between 600 and 1,400 feet above sea level, reflecting the horst and graben structure. The Shield is a complex of rock outcrops, peat, muck and sandy and gravelly

loam soils. The graben have not been deeply filled. There are only a few pockets of soils sufficiently large and homogeneous to be mapped on a series basis at a scale of 1:63,360. These soils have moderate to severe limitations for agriculture (2).

Crops presently grown in the area appear to be well adapted to the climate. Weather records indicate a frost-free period ranging between 104 days at Clontarf at the foot of Mount St. Patrick scarp in the Shield, to 125 days at Renfrew in the Lowland (3). Nearly 40 per cent of the 30 inches of mean annual precipitation at Sand Point on the Ottawa River occurs during the period May to August inclusive; at Clontarf, 35 per cent of the 29-inch mean annual precipitation occurs during the same period. The average daily mean temperatures during the period are 60°F. and 62°F. respectively (4).

It is clear from these data that Clontarf, 35 miles west-southwest of Sand Point, is at a disadvantage regarding crop production, particularly in terms of the length of frost free period. As it affects the growing of hay and oats, the crops which predominate at present, the difference between the two areas is thought to be of little significance.

As is to be expected, agricultural settlement is most extensive in the Ottawa Lowland where a relatively high proportion of the land is suited to cultivation. In the Shield, however, most of the land has never been cultivated and much of what was once tilled has been reverting to forest since the 1930's. Settlement in this area is sparse.

FARM CLASSIFICATION

Realistic plans for farm adjustments must be closely tailored to available farm resources. Limitations of time and resources, however, precluded the study of individual farms in detail. The use of a farm classification system was indicated. As prescribed by the overall purpose of the study, the classification system should group together farms having similar income changes resulting from similar business adjustments. That is, farms having similar production functions should be in the same class.

Farms were classified on the basis of data obtained from farmers, pedologists, agronomists, agricultural engineers, and animal husbandmen as well as a variety of published material including weather records, soil maps and fertility trials.

The field classification of farms consisted of a roadside appraisal in conjunction with records from

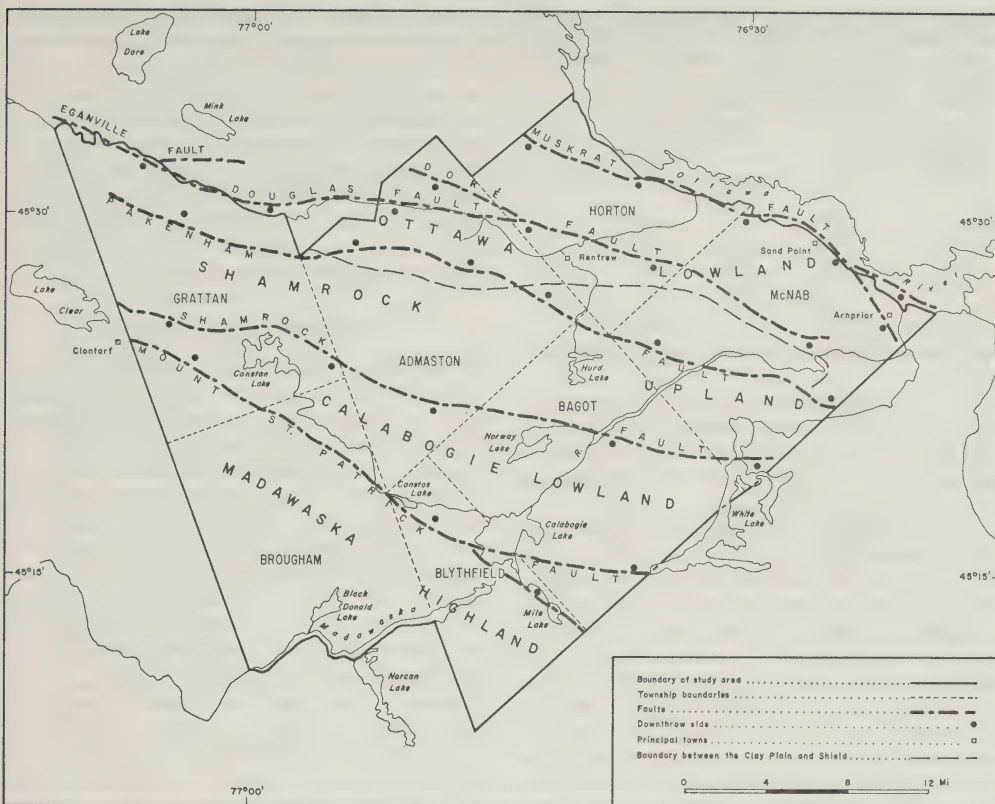


FIGURE 1

nearby similar businesses, the soil map and aerial photographs. Judgments were made as to the extent of income response to added investment for each farm under the assumption of good management. Long-run development possibilities were an important consideration in this process. It is recognized that analyses made on this basis will not specifically apply to any one farm, but they should be of relevance to most farms.

Class I is made up of farms having a low overall response (5). Most of the land is severely limited in its use for agriculture by rock outcrops, stoniness, coarse-textured and infertile soils, rough topography, or poor drainage. The 1964 average gross value of product sales of \$2,672 (Table 2) indicates that many of the existing farms will likely be incorporated into adjacent ones, turned into part-time farms or be used for recreational purposes. Non-land real estate inputs are usually poorly maintained and quite inefficient. Fields average less than eight acres in size and are surrounded by stone-filled hedgerows.

The principal soils in response class I are the Mont-eagle-rock complex, the Tweed-rock complex, Eganville loam-rocky phase, Eganville loam-shallow phase, Burnstown loam, White Lake gravelly sandy loam and Westmeath gravelly sandy loam. Most of the response class I farms have the Mont-eagle-rock complex or the Tweed-rock complex as their principal soils, at least in terms of area. The area of the rock complexes is generally unsuited to cultivation, and only small widely scattered areas of Eganville, Burnstown, White Lake or Westmeath soils offer better alternatives. But their small areas are often too isolated, too stony, too shallow, or steep for even moderately efficient operations. Only 2 per cent of the farms have soils rated above capability class 4 (Table 1). The crop yield index for class I is 80, indicating crop yields well below the county average.

Class II comprises farms on which short-run response is only moderate. With 1964 gross value of product sales of \$4,997 it is evident that existing farm businesses do not provide for the operator's

TABLE 1—PERCENTAGE DISTRIBUTION OF FARMS ACCORDING TO THE SINGLE MOST EXTENSIVE SOIL CAPABILITY UNIT ON EACH FARM, SOUTHEASTERN RENFREW COUNTY

Soil Capability Rating	Response Classes			
	I	II	III	All
	per cent			
2	2	63	94	55
3	—	—	—	—
4	38	18	4	19
5	14	—	—	4
6	—	9	—	3
7	46	10	2	19
Totals.....	100	100	100	100

living requirements and new capital. Non-land real estate items do not lend themselves to efficient use. Most of the farms in this class are small but do have responsive land resources, so that long-run development possibilities are good.

The principal soils in response class II are Renfrew clay, Renfrew-sand complex, Rideau clay, Rideau-sand complex, Uplands fine sandy loam and Eganville loam. Sixty-three per cent of the farms have soils of capability class II. In many parts of the class II areas these soils occur in a pattern somewhat more complex than in class III, and obstructions such as rock outcrop and stoniness combine with in-field soil variability to make it more difficult to operate efficiently and to combine farms into larger units. The Eganville loams in this class are more stony than those in class III. A crop yield index of 94 for class II farms indicates yields slightly below the county average.

Class III comprises farms on which response is high. Farming returns are sufficient to justify relatively large investments in buildings and equipment. The 1964 average gross value of product sales of \$13,746 results from larger farms on which the rates of production are higher, and on which buildings and machinery complements permit relatively efficient operation. The soils on most of the farms in this class have responded well to technological changes in the past and show promise of doing so in the future.

The principal soils in response class III are Renfrew clay, Renfrew-sand complex, Rideau clay, Rideau-sand complex, Eganville loam and Uplands fine sandy loam. Ninety-four per cent of the farms in this class are on soils of capability class II. Seventy per cent of the farms are on Renfrew clay and Rideau clay. These farms have relatively uniform soils that have responded well to soil amendments and technological change. On the better farms, in this class particularly in the area west of Renfrew, tiling and ditching is extensive. Many farmers have found that relatively little drainage is required to make the soils

suitable for alfalfa. The remaining 30 per cent of the farms have less responsive soils, in which variability is greater, especially in the clay-sand complexes. But, ease and timeliness of operations more than offset this variability. The extent of Eganville loam in response class III is small. It has relatively few stones. Uplands fine sandy loam, a capability class 4 soil, is being used in the area northwest of Renfrew, to grow tobacco with the aid of irrigation. The crop yield index of 102 for response class III indicates that yields are just above the county average.

DESCRIPTION OF FARMS

A general description of the commercial farms in each response class is given in Table 2. The figures shown are arithmetic means from a 20 per cent simple random sample of farms taken in 1964. In 1966 a purposive sample of 36 farms was selected, and labor income records were taken. The better farms (6) in each response class were chosen because data from these farms are more indicative of the results that can be obtained under good management. A proportionately larger sample was taken from response class III than from the other two classes because its farms tend to show the nature of response to more intensive management on the important soil classes.

Financial data from this purposive sample by response class and for the sample as a whole are given in Table 3. The figures for the whole sample are biased upward because of the heavier sampling rate in class III. Some of the values shown in Table 3 have been strongly influenced by severe drought conditions that existed in 1965. Livestock sales, inventory increases (largely in feed and supplies), and purchases of feeds, especially grain, are likely higher than normal.

The differences between response classes shown in Table 3 are in good agreement with those in Table 2 and are those to be expected from the way in which the response classes were established.

BENCHMARK FARMS

A benchmark farm was established for each response class to provide a starting point for adjustment analyses and to serve as a summary description of the farms and farm businesses. The benchmark farms approximate average response within each class. The major factors used in their selection were morphological soil class, cultivated acreage, number, kinds and sizes of enterprises, and rates of production.

Farm organization and costs and returns for each of the benchmark farms are given in Tables 4 and 5. On the class I benchmark farm the crop rotation is 2 years of oats and 8 years of hay. About 10 acres, mainly hay, are manured annually. No commercial

TABLE 2—CHARACTERISTICS OF COMMERCIAL FARMS, SOUTHEASTERN RENFREW COUNTY, 1964

	Response Classes			
	I	II	III	All
Number of part-time farms surveyed.....	41	17	3	61
Number of commercial farms surveyed.....	37	40	41	118
Commercial farms surveyed as a per cent of all farms in each class...	9	14	27	14
FARM DESCRIPTION				
Total work units ^a	245	313	605	390
Work units on livestock.....	166	209	431	270
Work units on crops.....	79	104	174	120
Total number of cattle.....	29	35	71	45
Total acres operated.....	352	283	360	331
Total cropped acres.....	56	85	143	96
Total acres of tillable pasture.....	15	32	64	37
Total acres of rough pasture.....	56	37	45	46
Total wooded acres.....	225	129	108	152
INTENSITY OF LAND USE				
Crop index ^b	80	94	102	92
Work units per 100 acres operated.....	70	110	170	118
Head of cattle per 100 acres operated.....	8	12	20	14
Cropped acres per head of cattle.....	1.9	2.4	2.0	2.1
PRODUCT SALES AND LAND VALUES				
Value of land and buildings.....	8,700	12,651	23,000	14,776
Value of land and buildings per cropped acre.....	155	149	160	154
Gross value of product sales.....	2,672	4,997	13,746	7,269
Gross value of product sales per cropped acre.....	48	59	96	76
Gross value of product sales per head of cattle.....	92	143	194	161
LABOR EFFICIENCY				
Work units per man.....	175	224	336	260
Cropped acres per man.....	40	61	79	64
Head of cattle per man.....	21	25	39	30

^aA work unit is the amount of directly productive work done by a typical operator in a 10-hour day, using typical production methods.

^bThe crop index compares crop yields relative to the County average which is taken to be 100.

fertilizer is used. The hay is cut early in July, well after the optimum cutting date. Oat seed is taken from the previous year's crop. No herbicides are used.

The class I farm has the following items of equipment: a two-plow tractor, half-ton truck, plow, disc, cultivator, harrows, wagon, mower, hay rake, grain drill and manure spreader. Most of these items are old, but still serviceable. Table 4 shows an equipment inventory value of \$4,000. The approximate new cost of these items is \$11,000.

The more important farm buildings are a clap-board structure used for feed and equipment storage, a 13 stanchion log stable used to house the cows, and another log building used for the other livestock. Neither of the log buildings has space for feed storage. The buildings are inconveniently arranged, both internally and with respect to each other. Field arrangement is similarly inconvenient; fields average six acres in size and are separated by stone-filled hedgerows.

The crop rotation on the class II benchmark farm consists of two years of oats and five years of hay and pasture. About 25 acres, mostly hay and pasture, are manured annually. No commercial fertilizer is used. Hay is cut early in July, well after the optimum cutting

date. Oat seed is taken from the previous year's crop. No herbicides are used.

The class II farm has the following items of equipment: a car, half-ton truck, three-plow tractor, plow, disc, harrows, cultivator, wagon, mower, rake, baler, grain drill, and manure spreader. A comparison of the inventory value of these items (\$7,600) with the approximate new price of these items, about \$17,000, indicates that the equipment used on the class II benchmark is somewhat newer and in better condition than that on the class I benchmark farm.

The main buildings consist of a conventional 20 stanchion barn with pen space, and adequate hay storage. A second frame structure provides space for equipment and feed storage. All buildings have electricity. There is no silo. The average field size is about 15 acres. Since there are very few stones on the farm the removal of hedge-rows would be much less difficult than on the class I benchmark farm.

The crop rotation on the class III benchmark farm is two years of small grains and corn, and five years of hay and pasture. About 45 acres of the corn, hay and pasture are manured each year. Commercial fertilizer is used only on the small grains and corn. Oats and barley receive about 150 pounds of 10-10-10

TABLE 3—FINANCIAL CHARACTERISTICS OF THE BETTER FARM BUSINESSES SOUTHEASTERN RENFREW COUNTY, 1966

	Response Classes			
	I	II	III	All
Number of farms.....	8	9	19	36
Number of crop acres.....	64	112	143	118
			dollars	
Building costs.....	122	95	1,291	732
Insurance all types.....	62	61	137	101
Dairy supplies.....	11	29	43	32
Breeding fees.....	35	58	98	74
Veterinary and medicine.....	32	46	142	94
Fence costs.....	27	19	71	48
Seeds and treatment.....	118	154	308	226
Taxes.....	239	301	498	391
Electricity.....	83	117	180	143
Fertilizer.....	128	110	380	256
Hired Labor.....	88	278	399	300
Unpaid labor.....	213	284	1,074	685
Purchased feed.....	1,917	1,742	6,169	4,117
Power equipment operating costs.....	543	651	1,283	961
Tractor operating costs.....	315	267	760	538
Other equipment operating costs.....	42	97	174	125
Equipment purchased.....	639	949	2,002	1,436
Livestock purchased.....	819	249	8,526	4,744
Total expenses.....	5,396	6,918	24,418	15,816
Livestock sales.....	3,073	2,344	16,365	9,906
Livestock product sales.....	796	3,756	6,493	4,543
Inventory increase.....	2,347	2,525	6,100	4,372
Total receipts.....	6,981	9,585	31,044	20,332
Ending inventory values				
land and buildings.....	14,000	23,800	33,000	26,556
livestock.....	6,189	8,317	16,201	12,005
power equipment.....	1,961	3,893	4,240	3,646
other equipment.....	1,979	3,868	8,565	5,927
feed and supplies.....	2,662	4,408	7,515	5,660
Total ending inventory.....	26,791	44,286	69,521	53,617
Labor Income.....	66	196	2,624	1,448

TABLE 4—BENCHMARK FARM ORGANIZATIONS

	Response Classes		
	I	II	III
			acres
Land Use			
Total Farm.....	250	196	320
Cropland.....	70	117	200
Oats.....	25	30	30
Barley.....	—	—	15
Corn.....	—	—	15
Hay.....	45	50	80
Pasture.....	—	37	60
Unimproved pasture.....	50	8	37
Woods and other.....	130	71	83
Livestock			head
Cows.....	13	15	25
Bull.....	1	1	—
Replacement heifers.....	2	4	5
Calves.....	13	13	22
Feeders.....	—	11	17
Sows.....	1	2	3
Hogs.....	6	14	21
Hens.....	40	100	150
Horses.....	2	—	—

TABLE 4—BENCHMARK FARM ORGANIZATIONS (Concluded)

	Response Classes		
	I	II	III
Inventory		dollars	
Real estate.....	14,000	16,000	30,000
Equipment.....	4,000	7,600	12,700
Livestock.....	4,600	5,500	10,700
Feed.....	700	1,100	1,800
Total inventory.....	23,300	30,200	55,200
Miscellaneous Factors			
Milk per cow pounds.....	3,500	5,500	6,500
Calf mortality, per cent.....	15	15	10
Hay per acre, tons.....	1.1	1.6	2
Corn per acre, tons.....	—	—	12
Oats per acre, bushels.....	25	35	40
Barley per acre, bushels.....	—	—	30

TABLE 5—BENCHMARK FARM COSTS AND RETURNS

	Response Classes		
	I	II	III
Receipts		dollars	
Cream or milk.....	770	1,810	6,500
Cows.....	320	330	840
Heifers.....	480	790	1,080
Steers.....	880	990	2,660
Swine.....	230	550	1,730
Eggs.....	120	390	650
Hens.....	—	10	20
Miscellaneous.....	150	200	200
Total Receipts.....	2,950	5,070	13,680
Expenses			
Seed and fertilizer.....	20	40	780
Power equipment.....	500	650	1,720
Other equipment.....	150	250	770
Machine hire.....	320	150	—
Feed.....	110	700	2,140
Veterinary and medicine.....	30	50	120
Dairy supplies.....	20	30	60
Labor, paid and unpaid.....	650	650	1,040
Real estate.....	350	480	1,000
Livestock purchases.....	50	200	150
Utilities and miscellaneous.....	200	250	630
Total Expenses.....	2,400	3,450	8,410
Farm Income.....	550	1,620	5,270
Interest on investment at 6 per cent.....	1,400	1,810	3,310
Labor Income.....	-850	-190	1,960

fertilizer per acre, and about 200 pounds of 5-20-10 plus 180 pounds of ammonium nitrate per acre are applied to corn. Hay is cut earlier than on the class I and class II benchmark farms, but later than the optimum. The use of herbicides and pasture management practices is small.

The class III farm has the following major items of equipment: a car, half-ton truck, two-plow and three-plow tractor, 2 plows, disc, harrows, cultivator, 2 wagons, hay rake, mower, baler, grain drill, manure

spreader, pull-type combine, milking machine, and can cooler. Corn harvesting equipment is owned in partnership with a neighbour. The value of the equipment inventory is about 53 per cent of the new cost (\$24,000), as opposed to about 36 per cent for the class I and about 45 per cent for the class II benchmark farms.

The barn is of conventional construction with 30 stanchions, pen space, and adequate hay storage. A second frame structure serves for equipment storage.

All buildings have electricity. The bunk silo holds 160 tons.

Response class I is characterized by highly unfavorable land resources and small, extensively operated farms that provide very low labor returns. The land resources in class II are responsive, but small farms and low levels of intensity combine to produce low labor returns. Class III farms are relatively large, and have responsive real estate resources. These factors combined with higher levels of farming intensity provide much higher labor returns.

ANALYTIC RESULTS

A wide range of farming alternatives, in terms of kind and intensity were established for linear programming analyses (7). Provision for farm business expansion was made by supplying varying amounts of loan capital. A relatively high level of management was assumed in each alternative.

Table 6 shows the farm organizations, receipts and expenses resulting from analyses based on the response class I benchmark farm. Although labor incomes can be increased by some \$1,200 over the benchmark situation, they persist at such a low level that no operator, possessing the required skills and knowledge, would be expected to remain on this or similar farms. The various plans shown in Table 6 are not those for "successful" farms; they do not provide competitive returns to their operators' labor and management. This benchmark farm does not respond (response being measured in terms of labor income) to levels of capital beyond those shown in the fourth column of Table 6. This is to be anticipated

from the criteria and methods used in the response classification of farms.

Table 7 shows the farm organizations, receipts and expenses suggested by analyses on the response class II benchmark farm. Given the assumed input-output relationships, prices and good management it seems clear that labor incomes can be increased substantially on farms similar to the response class II benchmark farm.

The various organizations shown may be so demanding in respect of skill and management ability as to be considered out of reach by many farmers. The expansion path shown by the sequence of plans in Table 7 is, however, not limited in its application by skill and management levels as long as those levels are high enough to justify farming, and distributed among enterprises in proportion to the assumed levels of skill and management.

The expansion path is to use capital to:

- (1) expand the dairy and swine enterprises to the limits of the farm's initial resource package,
- (2) expand acreage of crop land and numbers of beef animals and/or dairy replacement heifers, as long as land and beef space are available, and
- (3) begin expansion of the dairy herd and facilities when the initial beef space is fully occupied. In the event that land is unavailable for purchase or rent, the expansion path is to build dairy space and begin a further intensification of the cropping program through the introduction of corn for silage.

Given the assumptions of this study, there are no conditions under which the construction of facilities for additional beef and/or swine is economically

TABLE 6—INCOME RESPONSE OF THE CLASS I BENCHMARK FARM TO ADDED CAPITAL; DAIRY, BEEF AND SWINE ENTERPRISES

Total Current Capital ^a	\$2,000	4,000	6,000	8,000	10,000	12,000	14,000
Borrowed Capital.....	\$ —	2,000	4,000	6,000	8,000	10,000	12,000
Crop acres.....	48	79	104	128	150	174	198
Pasture.....	7	11	15	18	21	25	28
Hay.....	17	28	37	46	54	62	71
Barley.....	24	34	52	64	75	87	99
Wheat.....	—	6	—	—	—	—	—
Dairy cows (X ₂₀).....	8	13	16	19	22	26	29
Dairy beef (X ₂₈).....	—	2	6	10	13	17	21
Sow, 2 litters each (X ₃₃).....	1	1	1	1	1	1	1
dollars							
Gross receipts.....	4,720	7,600	9,840	12,080	14,140	16,880	19,120
Variable expenses.....	2,020	3,890	5,600	7,310	8,940	10,740	12,480
Fixed expenses.....	1,970	2,090	2,470	2,640	2,950	3,670	4,340
Total expenses.....	3,990	5,980	8,070	9,950	11,890	14,410	16,820
Farm Income.....	730	1,620	1,770	2,130	2,250	2,470	2,300
Labor Income.....	—540	290	220	440	380	250	—170

^aTotal current capital supplied does not cover fixed costs, but does include the annual service costs of loans equal to the purchase prices of added land and buildings. Hence, total expenses exceed total current capital by the amount of fixed expenses less annual service costs of these loans.

TABLE 7—INCOME RESPONSE OF THE CLASS II BENCHMARK FARM TO ADDED CAPITAL; DAIRY, BEEF AND SWINE ENTERPRISES

Total Current Capital	\$4,000	8,000	12,000	16,000	20,000	24,000
Borrowed Capital	—	4,000	8,000	12,000	16,000	20,000
Crop acres.....	88	141	193	233	250 ^a	250
Pasture.....	12	20	27	33	35	39
Hay.....	32	50	69	84	90	86
Oats.....	16	—	—	—	—	—
Barley.....	—	71	97	116	125	119
Wheat.....	28	—	—	—	—	—
Corn for silage.....	—	—	—	—	—	6
Dairy cows (X ₂₀).....	18	20	20	28	46	73
Dairy beef (X ₂₅).....	—	23	43	52	40	7
Dairy repl. heifers (X ₂₈).....	—	12	29	32	23	—
Sows, 2 litters each (X ₃₃).....	3	3	3	3	3	3
dollars						
Gross receipts.....	11,920	18,600	24,600	30,690	35,750	40,180
Variable expenses.....	4,080	7,750	11,090	14,370	16,990	20,220
Fixed expenses.....	3,360	3,780	4,010	5,100	6,300	6,810
Total expenses.....	7,440	11,530	15,100	19,470	23,290	27,030
Farm Income.....	4,480	7,070	9,500	11,220	12,460	13,150
Labor Income.....	2,190	4,470	6,550	7,540	8,230	8,560

^aTotal acreage arbitrarily bounded at this level.

TABLE 8—INCOME RESPONSE OF THE CLASS III BENCHMARK FARM TO ADDED CAPITAL; DAIRY, BEEF AND SWINE ENTERPRISES

Total Current Capital	\$11,000	16,000	21,000	36,000
Borrowed Capital	\$ —	5,000	10,000	25,000
Crop acres.....	200	244	308	430 ^a
Pasture.....	28	35	44	66
Hay.....	72	87	110	149
Corn for silage.....	—	—	—	8
Barley.....	100	122	154	207
Dairy Cows (X ₂₀).....	10	30	30	69
Dairy beef (X ₂₅).....	31	29	55	56
Dairy repl. heifers (X ₂₈).....	64	50	71	77
Sows, 2 litters each (X ₃₃).....	7	7	7	7
dollars				
Gross receipts.....	24,420	32,190	39,840	60,550
Variable expenses.....	11,040	15,450	19,680	31,570
Fixed expenses.....	4,600	4,860	5,590	8,430
Total expenses.....	15,640	20,310	25,270	40,000
Farm Income.....	8,780	11,880	14,570	20,550
Labor Income.....	5,730	8,500	10,530	14,640

^aTotal acreage arbitrarily bounded at this level.

desirable, providing that the dairy enterprise, X₂₀, is permitted as an alternative. The presence of beef and swine enterprises in the various farm plans hinges entirely on the beef and swine housing initially present on the benchmark farms.

Results of analyses based on the response class III benchmark farm are shown in Table 8. A comparison of Tables 7 and 8 indicates that basic farm organizations are similar. The expansion path discussed in connection with response class II farms is also indic-

ated by the sequence of plans shown in Table 8. The relatively greater emphasis on beef in the class III situation appears to be due to a slightly higher ratio of beef space to dairy space than is the case in class II and a much higher capital to land ratio in the last plan for class II (Table 7) than in the last plan for class III (Table 8). If additional capital beyond the \$36,000 level were made available in the class III situation, a further increase in dairying would be expected. Both the short and long-run development possibilities on the class III farm are good.

REQUIREMENTS FOR COMPETITIVE FARMS

Although none of the plans in Tables 6, 7 and 8 deal solely with dairying, these and other data which have been omitted for the sake of brevity indicate that dairy, under the assumed conditions is the most profitable single enterprise. These plans also provide data in respect of efficient cropping programs for the support of a dairy herd. These data have been used to establish a plan for a dairy farm providing what is suggested to be a competitive labor return for a skilled operator (Table 9).

TABLE 9—PLAN FOR A 50-COW DAIRY FARM, RESPONSE CLASS II

Receipts	dollars
Milk, calves, cull cows from a herd of 50 cows (X ₂₀).....	25,250
Variable Expenses	
Pasture, 25 acres at \$ 3.30.....	80
Hay, 55 acres at \$10.80.....	600
Barley, 80 acres at \$11.10.....	890
Cows, 50 at \$85.00.....	4,400
Labor.....	4,200
Fertilizer.....	850
	11,020
Fixed Expenses	
Taxes.....\$ 450	
Insurance.....\$ 120	1,650
Buildings.....\$ 1,080	
Equipment depreciation.....	2,250
Car and truck operation.....	500
Utilities and miscellaneous.....	510
	4,910
Total Expenses.....	15,930
Farm Income.....	9,320
Interest at 6 per cent on average farm inventory	
real estate.....\$39,000	
equipment.....15,000	
feed.....3,600	
livestock.....14,000	
	\$71,600 × .06 4,300
Labor Income.....	5,020

The farm plan in Table 9 represents good management of crops and cows. The major components of the technology assumed in respect of the dairy enterprise are a conventional stanchion barn, a four unit milker and a bulk cooler. Compared to other systems, the technology assumed here does not lend itself to efficient labor use.

It is likely that the competitive position of farms represented by this plan will decline as farm costs continue to increase and as the more efficient technology already in existence is used more widely in the industry. This farm plan represents, therefore, a situation that should be competitive for only a relatively short period of time.

Table 9 indicates that annual sales of about 550,000 pounds (\$4.00/cwt., f.o.b. farm) are required under the conditions established for this study to provide what might be considered a competitive labor return. Present subsidized prices offer good incentive to some farmers to expand their dairy enterprise.

In order for the incentive to be effective additional subsidy quotas must be available. Present prices do not offer much incentive for expansion to dairy men whose rates of production of milk and crops are only moderate. Table 10 shows farm plans for various amounts of capital when 9,000 lbs. of milk per cow are sold and crop yields are reduced by about 15 per cent.

If needed adjustments are made in the dairy industry there will be fewer dairy farms and reduced milk production. A large quantity of agricultural resources will be freed for alternative production possibilities. In Renfrew County, and much of eastern Canada, beef cattle and swine are the two main alternatives. It is of interest therefore, to examine the requirements of competitive farms based on these enterprises.

Tables 11 and 12 show farm organizations, receipts and expenses for the class I and II benchmark farms for various amounts of capital, when dairying is excluded as an alternative. Table 11 indicates that the response class I benchmark farm cannot be built up to provide a competitive labor income. It is likely that a competitive livestock operation having land resources similar to those of the class I benchmark farm would need to be based to an important extent on purchased feed.

Table 12 specifies the nature of competitive farms based on swine and dairy replacement heifers. Although the opportunities for raising and selling these heifers by non-dairy farmers are increasing, the demand for them does not appear to be sufficient to make this a feasible enterprise for very large numbers of operators.

Table 13 shows expansion plans for the class II benchmark farm when the only beef enterprises permitted are those using the standard beef breeds. The labor incomes shown are relatively low.

The farm plans in Tables 7 to 13 indicate that there are opportunities for substantial farm development in response classes II and III. The development of competitive farms requires good management, high rates of crop and animal production and a sufficient acreage of responsive soils.

In the present context of farm development in Renfrew County and in similar areas in eastern Canada where public funds are being used to speed farm development these requirements should serve to guide the use of those funds, and of private investment as well. Under foreseeable price and demand conditions for agricultural products, and given the

TABLE 10—INCOME RESPONSE OF THE CLASS II BENCHMARK FARM TO ADDED CAPITAL; DAIRY, BEEF AND SWINE ENTERPRISES; LOWER RATES OF PRODUCTION

Total Current Capital	\$ 6,000	8,000	12,000	15,402
Borrowed Capital	\$ 2,000	4,000	8,000	11,402
Crop acres	140	167	210	250
Pasture	20	24	30	36
Hay	50	59	75	89
Barley	46	83	105	125
Wheat	24	—	—	—
Dairy cows (X ₁₃)	—	2	14	20
Dairy beef (X ₂₆)	32	39	46	56
Dairy repl. heifers (X ₂₃)	40	44	37	39
Sows, 2 litters each (X ₃₂)	3	3	3	3
Gross receipts	13,450	16,120	21,490	26,150
Variable expenses	5,750	7,380	10,880	13,870
Fixed expenses	3,700	3,820	4,660	5,150
Total expenses	9,450	11,200	15,540	18,910
Farm Income	4,000	4,920	5,950	7,240
Labor Income	1,400	2,100	2,570	3,230

TABLE 11—INCOME RESPONSE OF THE CLASS I BENCHMARK FARM TO ADDED CAPITAL; BEEF AND SWINE ENTERPRISES

Total Current Capital	\$2,000	4,000	6,000
Borrowed Capital	\$ —	2,000	4,000
Crop acres	52	93	123
Pasture	7	13	17
Hay	19	33	44
Barley	26	47	62
Dairy beef (X ₂₆)	—	3	27
Dairy repl. heifers (X ₂₃)	15	25	25
Sows, 2 litters each (X ₃₂)	3	4	1
Gross receipts	4,160	6,780	9,060
Variable expenses	1,540	3,650	5,600
Fixed expenses	2,030	2,150	2,630
Total expenses	3,570	5,800	8,230
Farm Income	590	980	830
Labor Income	-710	-480	-860

assumed prices of farm input items, farm real estate expansion should be restricted to high quality soils. In Renfrew County these are mainly the Renfrew and Rideau clays and their sand complexes.

Competitive farm businesses are considered to require amounts of these soils something in excess of 200 acres with average yields of alfalfa-brome grass hay, oats and barley being about 3 tons, 70 bushels and 50 bushels per acre, respectively. One of the important characteristics of good management is the obtaining of these yields at competitive costs.

Farm real estate expansion, or farm consolidation, on any but responsive soil resources will ensure that low incomes persist in the present or will return in the near future. Responsive cropland in Renfrew County

TABLE 12—INCOME RESPONSE OF THE CLASS II BENCHMARK FARM TO ADDED CAPITAL; BEEF AND SWINE ENTERPRISES

Total Current Capital	\$ 6,000	8,000	12,000	16,000
Borrowed Capital	\$ 2,000	4,000	8,000	12,000
Crop acres	128	154	202	249
Pasture	18	22	29	35
Hay	46	55	72	89
Barley	39	77	101	125
Wheat	25	—	—	—
Dairy beef (X ₂₆)	35	20	—	—
Dairy repl. heifers (X ₂₃)	46	63	92	114
Sows, 2 litters each (X ₃₂)	3	7	15	18
Gross receipts	14,830	17,240	23,180	28,320
Variable expenses	5,900	7,230	10,070	12,980
Fixed expenses	3,470	3,960	4,500	5,710
Total expenses	9,370	11,190	14,570	18,690
Farm Income	5,460	6,050	8,610	9,630
Labor Income	3,040	3,260	5,320	5,530

TABLE 13—INCOME RESPONSE OF THE CLASS II BENCHMARK FARM TO ADDED CAPITAL; BEEF FINISHING AND SWINE ENTERPRISES

Total Current Capital.....	\$ 6,000	8,000	12,000	16,000	20,000
Borrowed Capital.....	\$ 2,000	4,000	8,000	12,000	16,000
Crop Acres.....	114	134	180	224	268
Pasture.....	16	19	25	32	38
Hay.....	41	48	64	80	96
Barley.....	57	42	42	78	115
Wheat.....	—	25	49	34	19
Cow-calf (X ₂₁).....	9	—	—	—	—
450 lb. calf long fed (X ₂₄).....	45	72	97	121	145
Sows, 2 litters each (X ₃₃).....	7	7	9	11	13
dollars					
Gross receipts.....	12,500	15,380	20,430	25,530	30,240
Variable expenses.....	5,850	7,540	10,750	13,860	16,970
Fixed expenses.....	3,590	3,700	4,650	5,070	5,930
Total expenses.....	9,440	11,240	15,400	18,930	22,900
Farm Income.....	3,060	4,140	5,030	6,600	7,340
Labor Income.....	670	1,620	1,840	3,000	3,140

is being sold at prices ranging from \$100 to \$150 per acre. An approximate doubling of the response class II benchmark farm's acreage would involve capital requirements of about \$12,000 to \$15,000. But much more capital is required for non-land real estate, equipment, livestock and current expenses if the added land is to be operated at the level of intensity necessary to permit the earning of competitive labor incomes. Farm consolidation is merely a part of the needed adjustments. A total investment of about \$70,000, an increase of about \$40,000 above the benchmark level, is indicated.

FOOTNOTES

- (1) Taken from *Agricultural Development Possibilities, South-eastern Renfrew County, Ontario*, an unpublished Ph.D. thesis, Dept. of Agricultural Economics, Cornell University, Ithaca, N.Y., 1967. This thesis and related work were done while the author was an employee of the Geographical Branch, Dept. of Energy, Mines and Resources. Their generous support is gratefully acknowledged.
- (2) J. E. Gillespie *et al.*, *Soil Survey of Renfrew County*, Report No. 37, Ontario Soil Survey (Ottawa and Toronto: Canada and Ontario Dept. of Agriculture, 1965).
- (3) Canada, Dept. of Transport, Meteorological Branch, *Climatic Summaries for Selected Meteorological Stations in Canada, Vol. III. Frost Data* (Toronto: 1956).
- (4) Canada, Dept. of Transport, Meteorological Branch, *Temperature and Precipitation Normals for Canadian Weather Stations based on the Period 1921-1950*. CIR 3208, CLI-19 (Toronto: 1959).
- (5) This attempt at forecasting response assumes a continuation of present trends in markets, cost-price structures, and advances in technology, as well as a continuation of the effects of these trends on various classes of farms, and is made relative only to other farms in the study area.
- (6) Chosen on the basis of knowledge gained in the 1964 survey, and on the advice of the county agricultural representative.

(7) Activities, prices and yields used were:

Activities

- X₁ Production of grass-alfalfa pasture
- X₂ Production of grass-alfalfa hay
- X₃ Production of corn for silage
- X₄ Production of oats
- X₅ Production of barley
- X₆ Production of wheat
- X₇ Purchase of hay
- X₈ Purchase of oats
- X₉ Purchase of barley
- X₁₀ Purchase of wheat
- X₁₁ Purchase of soybean oil meal
- X₁₂ Purchase of cracked corn
- X₁₃ Sale of hay
- X₁₄ Sale of oats
- X₁₅ Sale of barley
- X₁₆ Sale of wheat
- X₁₇ Holstein cow— 8,000 lbs. of milk sold
- X₁₈ Holstein cow— 9,000 lbs. of milk sold
- X₁₉ Holstein cow—10,000 lbs. of milk sold
- X₂₀ Holstein cow—11,000 lbs. of milk sold
- X₂₁ Beef cow and calf; calf sold weighing 450 lbs. at 6 months
- X₂₂ 450 lbs. calf fed to 1,000 lbs. in 240 days
- X₂₃ 450 lbs. calf roughed through one winter, summer-pastured and fall-finished at 1,000 lbs., in 340 days
- X₂₄ 450 lbs. calf roughed through winter, summer, winter, finished in the second summer at 1,160 lbs., in 665 days
- X₂₅ 750 lbs. feeder finished at 1,050 lbs. in 120 days
- X₂₆ Holstein drop calf fed to 1,000 lbs. in 420 days
- X₂₇ Holstein drop calf long fed to 1,160 lbs. in 850 days
- X₂₈ Holstein drop calf raised as a replacement heifer to calve at 730 days, weighing 1,100 lbs.
- X₂₉ Holstein drop calf vealed on milk replacer, sold in 70 days at 225 lbs.
- X₃₀ 16 weaner pigs (40 lbs.) raised to 200 lbs. using commercially prepared feeds exclusively.
- X₃₁ Sow, 2 litters of 8 pigs per year, sold as weaners
- X₃₂ 16 weaner pigs (40 lbs.) raised to 200 lbs. using home-grown feed
- X₃₃ Sow, 2 litters of 8 pigs per year raised to 200 lbs.
- X₃₄₋₄₀ Hiring of labor

X ₄₁	Borrowing of money for 1 year
X ₄₂₋₄₄	Purchase of fertilizer
X ₄₅	Purchase of 1 acre of land
X ₄₆	Purchase of 100 square feet of swine space
X ₄₇	Purchase of 1 dairy cow space
X ₄₈	Purchase of 100 square feet of beef space

Input prices

hay, ton	\$25.00
oats, ton	60.60
barley, ton	61.80
wheat, ton	67.00
soybean oil meal, ton	96.40
cracked corn, ton	71.00
labor, hour	1.25
current capital, \$1 for 1 year	0.06
N, pound	0.142
P ₂ O ₅ , pound	0.108
K ₂ O, pound	0.065
land, response class I, acre	40.00
land, response classes II and III	100.00
dairy space, cow	400.00
swine space, 100 sq. ft.	450.00
beef space, 100 sq. ft.	250.00
pig starter, ton	96.50
hog grower, ton	75.60
hog finisher, ton	72.00
milk replacer, 100 pounds	15.90
replacement dairy cow, head	280.00
dairy breed drop calf, head	20.00
replacement beef cow, head	190.00
replacement sow, head	80.00
artificial breeding fee	7.00

good feeder steers, 100 pounds	22.16
weaner pigs, head	13.00

Product prices

milk, 100 pounds, net at the farm	\$ 4.00
cull dairy cow, head	160.00
dairy replacement heifer, head	280.00
dairy drop calf, head	20.00
cull beef cow, head	132.00
finished beef steers, good, 100 pounds	23.11
finished dairy beef, medium steers, 100 pounds	21.14
weaner pigs, head	11.00
veal calves, 100 pounds	30.64
market hogs, dressed, grade A, 100 pounds	28.95
market hogs, dressed, grade B, 100 pounds	27.95
hay, ton	20.00
oats, bushel	0.75
barley, bushel	1.10
wheat, bushel	1.42

Crop yields

Crops	Response Classes		
	I	II	III
pasture, dry matter, tons/acre	1.1	1.8	1.8
hay, tons/acre	1.8	2.9	2.9
corn for silage, tons/acre	10	16	16
oats, bushels/acre	50	70	70
barley, bushels/acre	35	50	50
wheat, bushels/acre	28	40	40

THE PROBABLE EFFECTS OF THE APPLICATION FOR RAILWAY BRANCH LINE ABANDONMENT ON THE GRAIN ELEVATOR INDUSTRY

D. Zasada

Railway branch line abandonment has been a matter of concern to the entire Western grain trade since the MacPherson Royal Commission on Transportation (1961) recommended that those branch lines which are unprofitable should be abandoned. The railway companies proceeded therefore to apply for permission to abandon those lines on which they contend there is a short fall of revenue over costs and are consequently uneconomic to operate. To the grain elevator companies and the Western grain producer abandonment would mean that the facilities for handling and storing grain along those lines would become inoperable under current licensing laws. To be licensed, a grain elevator must be on track.

OBJECTIVES

The purpose of this study was to try to determine the effect that impending abandonment has upon the investment plan of the grain elevator companies. More specifically it attempted to obtain answers to such questions as:

1. If branch lines are abandoned will this mean a reduction of total storage capacity?

2. If the grain elevator companies replace storage space lost due to abandonment, what form will it take?

METHOD

Answers to the above questions were sought by studying two railway branch lines that have been abandoned. These are the Deloraine—Holmfeld line in Manitoba, and the Wolseley, Saskatchewan—Reston, Manitoba line. The Deloraine—Holmfeld line is bordered by a line that has not been applied for abandonment while the Wolseley—Reston line is. The changes in grain elevator capacity that have taken place along the abandoned lines, as well as at the adjacent points, should give some idea of what action will be taken by grain elevator companies if more abandonments take place.

RESULTS

The changes in storage capacity and grain handlings that have occurred on the abandoned railway lines as well as for the points adjacent to them between the crop years 1960-61 and 1966-67 are shown in Tables 1 and 2.

TABLE 1—CHANGES IN ELEVATOR CAPACITY AND GRAIN HANDLINGS ALONG THE DELORAINE—HOLMFELD BRANCH LINE AND ITS ADJACENT POINTS BETWEEN THE CROP YEARS 1960-61 AND 1966-67

Elevator Point	Capacity		Handlings		Handling to Capacity Ratio	
	1960-61	1966-67	1960-61	1966-67	1960-61	1966-67
	bushels		bushels			
ABANDONED LINE						
Coatstone.....	49,000	closed	61,951	closed	1.3	closed
Liege.....	49,000	"	62,033	"	1.3	"
Mountainside.....	86,100	"	97,982	"	1.1	"
Wassewa.....	22,000	"	24,917	"	1.1	"
Horton.....	73,400	"	80,745	"	1.1	"
Wakopa.....	58,000	"	101,279	"	1.7	"
Lena.....	179,900	"	192,354	"	1.1	"
Enterprise.....	62,100	"	67,531	"	1.1	"
Total.....	579,500	Nil	688,792	Nil	1.2	Nil
Change.....	-579,500					
ADJACENT POINTS						
Deloraine.....	232,700	375,500	432,767	856,520	1.8	2.3
Boissevain.....	337,900	495,100	640,259	1,293,572	1.9	2.6
Ninga.....	243,500	243,500	271,655	393,111	1.1	1.6
Rhodes.....	27,000	27,000	43,812	50,218	1.6	1.8
Killarney.....	291,000	618,600	513,554	1,335,994	1.8	2.2
Holmfild.....	44,000	50,000	78,930	186,403	1.8	3.7
Total.....	1,176,100	1,809,700	1,980,977	4,115,818	1.7	2.3
Change.....	+633,600					

Source: Board of Grain Commissioners.

TABLE 2—CHANGES IN ELEVATOR CAPACITY AND GRAIN HANDLINGS ALONG THE WOLSELEY—RESTON BRANCH LINE AND ITS ADJACENT POINTS BETWEEN THE CROP YEARS 1960-61 AND 1966-67

Elevator Point	Capacity		Handlings		Handling to Capacity Ratio	
	1960-61	1966-67	1960-61	1966-67	1960-61	1966-67
	bushels		bushels			
ABANDONED LINE						
Adair.....	27,000	closed	78,979	closed	2.9	closed
Deveron.....	16,000	"	82,197	"	5.1	"
Baring.....	24,000	"	85,073	"	3.5	"
Windthorst.....	172,100	"	334,249	"	1.9	"
Neelby.....	35,000	"	71,620	"	2.0	"
Bender.....	25,000	"	51,889	"	2.1	"
Kennedy.....	160,000	"	210,213	"	1.3	"
Dumas.....	54,000	"	99,383	"	1.8	"
Wawota.....	120,000	"	227,999	"	1.9	"
Walpole.....	24,000	"	102,132	"	4.2	"
Fairlight (CPR).....	65,000	"	106,859	"	1.6	"
Maryfield (CPR).....	98,000	"	181,618	"	1.9	"
Ebor.....	82,600	"	230,293	"	2.8	"
Ewart.....	40,500	"	105,800	"	2.6	"
Total.....	943,200	Nil	1,968,300	Nil	2.1	Nil
Change.....	-943,200					
ADJACENT POINTS						
Montmartre.....	194,000	244,000	530,158	837,550	2.7	3.4
Candiac.....	162,000	177,000	367,281	536,774	2.3	3.0
Glenavon.....	105,000	189,000	367,351	723,487	3.5	3.8
Kegworth.....	47,000	47,000	68,606	126,188	1.5	2.7
Peebles.....	29,000	73,000	130,678	363,616	4.5	5.0
Dalzell.....	24,000	97,000	98,480	437,320	4.1	4.5
Kipling.....	201,000	338,800	460,738	1,052,004	2.3	3.1
Inchkeith.....	135,000	216,000	237,492	519,857	1.8	2.4
Langbank.....	171,000	226,000	243,897	948,139	1.4	4.2
Vandura.....	42,000	69,000	64,045	278,183	1.5	4.0
Kelso.....	72,000	72,000	123,381	396,388	1.7	5.5
Doonside.....	26,000	53,000	72,516	200,642	2.8	3.8
Fairlight (CNR).....	67,000	137,900	94,911	364,049	1.4	2.6
Ryerson.....	63,000	84,900	160,496	210,404	2.5	2.5
Maryfield (CNR).....	48,000	168,000	170,903	465,232	3.6	2.8
Reston.....	189,500	189,500	407,056	605,982	2.2	3.2
Cromer.....	76,200	203,200	160,387	563,776	2.1	2.8
Total.....	1,651,700	2,585,400	3,758,376	8,629,591	2.3	3.4
Change.....	+933,700					

Source: Board of Grain Commissioners.

The amount of increased storage space at adjacent points is very close to the amount of storage space lost due to the abandonment of the branch lines, however, the structure of the increases is quite different. The capacity changes along the points adjacent to the Wolseley—Reston line are generally more frequent but smaller than those changes along the points adjacent to the Deloraine—Holmfild line. The average change at points adjacent to the Deloraine—Holmfild line is 105,600 bushels; whereas the average change at points adjacent to the Wolseley—Reston line is 54,900 bushels. In the case of the points adjacent to the Deloraine—Holmfild line the additional capacity was created mainly by an increase in the number of grain elevators. There was also an increase in the number of companies represented (Table 3).

Those elevator points listed in Table 3 from Montmartre to Fairlight (CNR) are on a line that

has been applied for abandonment while the points from Ryerson to Cromer are on lines that have not been applied for. From Montmartre to Fairlight (13 shipping points) there are fewer increases of elevators or companies than from Ryerson to Cromer (4 shipping points) or between Deloraine and Holmfild (6 shipping points). On lines applied for abandonment increased capacity has been in the form of annexes, while on lines not applied for abandonment the increase has been in the form of elevators.

One measure of efficiency of a grain elevator is its handling to capacity ratio. It has been said that for a grain elevator to pay for itself, it must maintain a ratio of between three and four. For the crop year 1960-61 none of the four lines (I) as a whole had such high ratios, although some of the small Saskatchewan shipping points had. For the crop year 1966-67, a year well above the ten-year average of handlings, the points adjacent to the Wolseley—Reston line

TABLE 3—CHANGE IN THE NUMBER OF ELEVATORS AND COMPANIES AT POINTS ADJACENT TO THE ABANDONED LINES

Elevator Point	1960-61		1966-67	
	Number of Elevators	Number of Companies	Number of Elevators	Number of Companies
Points Adjacent to the Deloraine—Holmfield Line				
Deloraine.....	3	2	4	3
Boissevain.....	3	2	5	4
Ninga.....	3	2	3	2
Rhodes.....	1	1	1	1
Killarney.....	4	3	5	3
Holmfield.....	2	1	1	1
Total.....	16		19	
Points Adjacent to the Wolseley—Reston Line				
Montmartre.....	3	2	3	2
Candiac.....	2	2	2	2
Glenavon.....	3	2	3	2
Kegworth.....	1	1	1	1
Peebles.....	1	1	1	1
Dalzell.....	1	1	1	1
Kipling.....	2	2	3	3
Inchkeith.....	3	2	2	2
Langbank.....	2	2	2	2
Vandura.....	1	1	1	1
Kelso.....	2	1	2	1
Doonside.....	1	1	1	1
Fairlight (CNR).....	1	1	2	2
Subtotal.....	23		24	
Ryerson.....	2	2	2	2
Maryfield (CNR).....	1	1	2	2
Reston.....	2	2	2	2
Cromer.....	1	1	2	2
Total.....	29		32	

Source: Board of Grain Commissioners.

had a ratio of 3.4, and the points adjacent to the Deloraine—Holmfield line had a ratio of 2.3. Had no expansion of capacity taken place at the adjacent points, and assuming the same handlings, the handling to capacity ratios would have been 5.2 and 3.5 respectively (2).

CONCLUSIONS

1. Storage capacity lost due to abandonment of branch lines tends to be replaced on adjacent lines.
2. Where risk of abandonment of adjacent lines is a significant factor the grain elevator companies adopt a short run policy of expanding storage space at many points along a line and in the form of annex space.
3. Where risk of abandonment of adjacent lines is not a significant factor the build-up of capacity tends to be concentrated in the larger centres and in the form of an increased number of licensed elevators.
4. The replacement of lost capacity does not permit the attainment of greater economies inherent in abandonment situations.

Since the grain elevator companies tend to replace lost capacity along adjacent lines, rail line abandonment will not significantly reduce total storage space in the Prairie Provinces. Abandonment will however provide grain producers with fewer but larger elevator centres. If no abandonment is allowed to take place, then that storage space which is currently being built in anticipation that some or all of those branch lines that have been applied for, will be abandoned, will remain as an absolute increase in storage space. The practice of building storage space because of abandonment or in anticipation of abandonment will however, prevent the country elevator from attaining economies made possible through an increased handling to capacity ratio (3).

Since the crop year 1960-61 country storage capacity has increased from 366 million bushels to 386 million bushels. If the grain elevator companies continue to build storage space to the extent that their facilities would be affected by proposed rail line abandonment, and no abandonments take place, one might expect some 430 million bushels of country storage space (4) in the Prairie Provinces. The current

storage capacity of 386 million bushels results in a handling to capacity ratio of less than two. From a turnover point of view any increases of storage space would render the industry even less efficient. This is not to conclude that no expansion of capacity should take place but rather that long run planning of grain handling and storing facilities is needed. It is unlikely that the present situation of uncertainty, due to impending branch line abandonment, provides the atmosphere under which the grain elevator companies can do so.

NOTES AND REFERENCES

- (1) Although not all adjacent points to the Wolseley to Reston abandoned branch line are on one line, they are referred to as a line.
- (2) These ratios are derived by dividing the handlings in 1966-67 by the capacity that existed in 1960-61.
- (3) See D. Zasada and Om P. Tangri, *An Analysis of Factors Affecting the Cost of Handling and Storing Grain in Manitoba Country Elevators*. Research Report No. 13, Department of Agricultural Economics and Farm Management, University of Manitoba, July 1967.
- (4) Since 1961 proposed abandonments would affect about 67 million bushels of country storage space.

EGG WHOLESALING IN CANADA

J. D. Kidd

The purpose of this article is to provide background information on one aspect of changes in the structure and organization of the egg marketing system in Canada.

Egg wholesaling firms occupy an important place in Canada's egg industry. Their independent and intermediary position in the egg distribution system is being constantly challenged on one side by producer-distributors and on the other by some chain retailers, both of which have integrated the wholesaling functions. Many egg wholesalers have reacted to these challenges from larger producer-distributors and from retail-integrators by reorganizing their operations to reduce their unit marketing costs to a competitive level.

Egg wholesalers may be classified broadly into three groups, namely, assembler-shippers, wholesale distributors and assembler-distributors. The assembler-shippers are usually located in surplus egg producing regions. They purchase eggs from producers and grade, pack and forward loose-packed eggs to wholesale distributors in the largest cities. The typical role of the wholesale distributor has been to receive, carton and distribute eggs to retailers and other commercial outlets. These kinds of firms occupy the oldest commercial marketing channel for eggs, that is, producer to assembler-shipper to wholesale distributor to retailer. A few, independent truck distributors in Toronto and Montreal still handle a part of the retail jobbing function in those cities. In recent years, the relative importance of assembler-distributors in wholesale trade has been increasing. These firms have integrated the assembly and distributing functions and may operate from two or more locations.

Poultry Products Wholesalers

The six bulletins on Wholesale Trade in the 1961 Census of Merchandising, the last of which became available in July, 1967, contain information on the numbers, locations, sizes and types of firms wholesaling eggs in Canada. According to these reports there were 324 poultry products wholesale locations operating in Canada in 1961. Reported sales of all products at these locations aggregated \$87 million, or an average value of \$265,000 per location.

Poultry products wholesalers are defined in the Census "as having 75 per cent or more of total sales consisting of poultry products". In the 1961 Census of Merchandising, poultry product wholesale locations are included with a business group defined as Food (except groceries) and Tobacco. Included in this major group are kinds of wholesale locations classified as combination dairy and poultry, dairy

products, fruits and vegetables, frozen foods, meat, produce, fish, confectionary and tobacco wholesale locations. Except for the combination dairy and poultry products dealers and the produce dealers, poultry products are not handled, to any great extent, by the other firms in the Food and Tobacco group.

Of the 324 poultry products wholesale locations, 210 locations were classified as primary product dealers (assemblers) who purchased most of their supplies directly from farmers. Annual aggregate sales at these locations in 1961 were reported at \$53 million, or an average of \$250,000 per location. Co-operatives accounted for 14 locations and aggregate annual sales of about \$7.0 million, but a larger proportion of these sales were made up of farm and household supplies than was the case at privately operated poultry products assemblers locations. Privately operated locations numbered 196 and reported average annual sales of \$230,000 for an aggregate total of \$46 million.

Also included among the 324 poultry product wholesale locations in Canada in 1961 were 114 locations that were classified as operated by wholesale merchants. In contrast with primary product dealers, wholesale merchants do not purchase the bulk of their supplies directly from farmers but rather from primary product assemblers. They are generally located closer to the retail marketing level. The aggregate sales of these 114 locations totalled \$34 million in 1961, or an average of almost \$300,000 per location. Wholesale distributors operated 111 of these locations while two locations were operated by commission merchants and one was defined as a manufacturer's sales branch.

The provincial distribution of poultry product wholesale locations, by type of operation, is shown in Table 1. In 1961, primary dealers in poultry products were operating 210 locations in nine provinces while wholesale distributors in poultry products operated 111 locations in nine provinces. Primary products dealers were more numerous in surplus producing provinces, that is, in Prince Edward Island, Ontario and the Prairie Provinces. On the other hand, in Quebec, a deficit producing province, wholesale distributors, who receive shipments from dealers in Ontario and the Prairies, outnumbered primary product dealers.

In all provinces, a portion of poultry product marketings move through two wholesale locations, that is, a primary products dealer and a wholesale distributor, both of whom specialize in poultry products. In addition, poultry products are also

TABLE 1—POULTRY PRODUCT WHOLESALE LOCATIONS, SALES AND NUMBER OF WORKING PROPRIETORS, BY PROVINCE, CANADA, 1961

Province	Locations				Sales million dollars	Working Proprietors number
	P.P.D.	W.D.	Other	Total		
	number					
Newfoundland.....	1			1		
Prince Edward Island.....	5	1		6		
Nova Scotia.....	3	3	1	7	1.9	4
New Brunswick.....		1		1		
Quebec.....	28	40	1	69	19.0	57
Ontario.....	119	42	1	162	51.2	145
Manitoba.....	17	4		21	6.4	15
Saskatchewan.....	3	4		7	0.4	6
Alberta.....	14	5		19	2.0	12
British Columbia.....	20	11		31	5.2	18
Canada.....	210	111	3	324	86.8	262

P.P.D.—Primary products dealer.

W.D.—Wholesale distributor.

Source: Dominion Bureau of Statistics, *1961 Census of Merchandising, Wholesale Trade*.

handled by other general wholesale distributors such as combination dairy and poultry products wholesalers and produce wholesalers. Poultry products wholesale establishments reported that 28 per cent of their aggregate sales in 1961 were made to other wholesalers. Although sales, by type of customer, were not reported separately by primary product dealers and by wholesale distributors, most of these sales to wholesalers would have been made by primary dealers to wholesale distributors. It is estimated that sales between primary dealers and wholesale distributors accounted for about 45 per cent of the total sales of the former, and for about two-thirds of the source of supply of the latter group of wholesalers.

Egg Marketings Through Wholesalers

An analysis of sales of primary product wholesale establishments (assemblers of farm products) in the Food and Tobacco group showed that eggs and dressed poultry accounted for 13.4 per cent and 4.9 per cent respectively of total sales of \$313 million. That is, aggregate sales of eggs and poultry totaled \$42 million and \$15 million respectively, or an overall total of \$57 million in poultry product sales by establishments in this group. Of the total trade of \$57 million in poultry products, eggs accounted for about 75 per cent. Dressed poultry (not eviscerated), that was slaughtered either by producers, or in dealer establishments, made up 25 per cent of the trade in poultry products.

A similar analysis of sales of wholesale merchants' establishments in the Food and Tobacco group revealed that eggs comprised 67.4 per cent of the sales of establishments that were classified as poultry product wholesale distributors, 37.4 per cent of the sales of combination dairy and poultry products

wholesalers, and 1.8 per cent of the sales of general produce wholesalers. For all merchant wholesalers it is estimated that egg sales in 1961 aggregated about \$29.1 million.

Combining the egg sales of primary product dealers and merchant wholesalers of \$42 and \$29 million respectively, sales of eggs in 1961 through wholesalers aggregated \$71 million. If 28 per cent of the aggregate sales volume in eggs were exchanged between primary and secondary wholesale receivers, then primary receipts of eggs at the wholesale level in 1961 accounted for about \$51 million. These primary receipts were obtained either directly from producers or from other first receivers (small, country egg grading stations) who were not covered among locations or establishments in the Census of Merchandising. Many of these first receivers may have been affiliated with the primary product dealers and wholesale merchants that were enumerated in the Census.

Total Egg Marketings

The Dominion Bureau of Statistics estimated that eggs sold for consumption in Canada (excluding Newfoundland) totaled 379 million dozens, and had a value of \$132 million at the producer level of sale in 1961. The Canada Department of Agriculture reported that egg sales through registered grading stations in Canada in 1961 totaled 207 million dozens at an average weighted price to producers of 31.3 cents per dozen, or an aggregate value of \$65 million, ungraded basis. Adding grading and packing charges of 10 cents per dozen, the wholesale value of these receipts would aggregate about \$86 million.

It is believed that most of the poultry product wholesalers included in the 1961 Census of Merchandising are also operators of registered egg grading

or packing stations. (A few poultry product distributors, who buy graded product from primary dealers, may not be registered stations.) According to these assumptions, it is estimated that Census wholesalers accounted for \$51 million, or for 59 per cent, of the graded value of \$86 million of eggs marketed by producers through registered egg stations in 1961.

In 1961, there were 1,025 egg grading stations and 103 egg packing stations that were registered with the Canada Department of Agriculture. These stations were operated by producers, wholesalers, manufacturers (meat packers, feed manufacturers, poultry meat processors etc.), and retailers (chains and independents). Generally speaking, these different firms were members of distinct and competitive marketing channels for eggs.

Direct Egg Marketings

As important as the volume of eggs marketed by producers through registered stations in 1961, was the volume that was marketed directly to consumers, retailers, other commercial and institutional establishments by producer vendors. Direct egg marketings and marketings through registered egg stations by producers, by province are shown in Table 2. In 1961, about 174 million dozens, or 46 per cent of producer marketings for edible uses were sold directly by producers to consumers and to retail establishments. Some of these eggs were producer graded while others were sold ungraded to consumers.

The relative importance of direct egg marketings by producers varies from province to province. In relation to total producer marketings of eggs, direct egg marketings are highest in those provinces that are either deficient in eggs, namely, Newfoundland—

67 per cent, New Brunswick—81 per cent and Quebec—62 per cent, or in those provinces where farm egg production is relatively large, namely Alberta—58 per cent and Saskatchewan—72 per cent.

On the other hand, the percentage of producer egg marketings through registered stations are highest in those provinces that are exporters, namely, Nova Scotia—59 per cent, Prince Edward Island—64 per cent, Ontario—66 per cent and Manitoba—64 per cent. A large portion of the egg marketings at registered stations in Alberta and Saskatchewan are shipped out of the province, largely to Manitoba, for further processing.

On a per caput basis, the relative importance of direct marketings to consumption is significantly different from the relative importance of direct marketings to production, by province. For example, in Newfoundland and in Quebec direct marketings per caput in 1961 were 3.5 and 6.8 dozens respectively although consumption per caput in those provinces was likely fairly close to the national average level of 22.6 dozens per caput in 1961. That is, direct marketings were a high percentage of total provincial production, but were less important in relation to provincial consumption. On the other hand, in Saskatchewan and in Alberta direct egg marketings were more important in relation to total egg consumption than to total egg production. The same situation is true with respect to direct marketings in Prince Edward Island, Nova Scotia, Ontario, and Manitoba.

Since 1961, the volume of eggs marketed directly by producers in Canada has declined steadily, and in 1966 direct marketings totaled 137 million dozens or about 38 per cent of total egg marketings by producers of 363 million dozens. Deliveries to registered egg

TABLE 2—EGG MARKETINGS: TOTAL, THROUGH REGISTERED EGG STATIONS AND DIRECT BY PRODUCERS, BY PROVINCE, CANADA, 1961

Province	Sold for Consumption		Registered Stations		Direct		
	Grand Total	Per Caput	Total	Per Cent of Grand Total	Total	Per Cent of Grand Total	Per Caput
	million dozen	dozen	million dozen	per cent	million dozen	per cent	dozen
Newfoundland.....	2.4	5.2	0.8	33	1.6	67	3.5
Prince Edward Island.....	3.6	34.3	2.3	64	1.3	36	12.4
Nova Scotia.....	17.2	23.3	10.1	59	7.1	31	9.7
New Brunswick.....	7.3	12.2	1.4	19	5.9	81	9.8
Quebec.....	57.0	10.9	21.4	38	35.6	62	6.8
Ontario.....	164.0	26.3	108.3	66	55.7	34	8.9
Manitoba.....	31.3	33.9	20.0	64	11.3	36	12.3
Saskatchewan.....	25.0	27.0	7.0	28	18.0	72	19.5
Alberta.....	34.4	25.8	14.6	42	19.8	58	14.9
British Columbia.....	38.8	23.8	20.8	54	18.0	46	11.0
Canada.....	381.0	20.8	206.0	54	174.4	46	9.6

Sources: 1. Dominion Bureau of Statistics, *Production of Poultry and Eggs*, 1961
2. Canada Department of Agriculture, *Poultry Market Review*, 1961

stations rose slightly from 207 million dozens in 1961 to 226 million dozens in 1966. This also represented a relative rise from 54 per cent of total marketings in 1961 to 62 per cent in 1966. During this five year period, the number of registered egg grading stations declined from 1,025 to 708 while the number of packing stations rose from 103 to 182, an overall reduction of 238 stations between 1961 and 1966. A sharp reduction in the numbers of small country grading stations accounts for most of the overall decline.

Channel Competition

Producer egg marketings through wholesalers have to meet the competition of direct marketings by producer vendors, and of chain retailers, operating their own procurement programs. One of the most important factors in determining the competitive position of wholesalers is the cost of the services they perform. The costs of these services, among which are assembly, grading, packing and distribution, are usually defined as total operating expenses. Net profit plus total operating expenses equals gross margin. The gross margins and total operating expenses as percentages of total net sales of poultry products wholesalers in Canada in 1961 are shown in Table 3.

Operating expenses and gross margins are shown for unincorporated firms (individual proprietorships or partnerships), incorporated firms and for co-operatives that have been defined as poultry products wholesalers in the 1961 Census (poultry products sales of 75 per cent or more of total sales). Operating expenses for unincorporated firms do not include a charge for the labor of working proprietors. The relatively higher operating expenses of the co-operative group reflects the fact that a larger portion of their sales is made up of farm and household supplies than is the situation with the privately operated firms. It should also be pointed out that packaging and packing supplies (cartons, filler-flats, cases, boxes) and assembly costs were included in the cost of goods

sold, which is the difference between the net sales and the gross margin. Since new packing material costs and assembly expenses will likely equal the total of reported expenses, this means gross margins of about 25 per cent, or a farm share of about 75 per cent of the wholesale selling price of eggs marketed through a primary wholesale dealer.

Operating expenses and gross margins are not shown separately in the Census for primary products wholesalers and for wholesale distributors. Wholesale distributors obtain about two-thirds of their supplies from assemblers, who have performed the assembly, packing and forwarding functions. Repackaging into cartons and distribution are major functions of the secondary receiver or wholesale distributor. For these reasons, it is impossible to estimate the net farm share of egg marketings through the wholesale channel, except that it is considerably less than 75 per cent since 45 per cent of primary wholesale receipts are resold to secondary wholesalers. Since the secondary receivers are generally located in urban centres, which may be in another province, freight expenses between wholesalers adds to the cost of marketing.

Although the wholesale marketing channel for eggs is generally competitive with the more direct channels employed by producer vendors, the extent of channel competition varies greatly between areas. For example, in farming areas where there are still large numbers of small farm flocks, many general stores do not bother to carry eggs because of the predominance of the direct farm to household method of distribution. In most cases these eggs are not graded by the producer. In the larger towns and cities, the direct and wholesale channels of distribution become directly competitive. In the larger markets, many producers undertake the grading, packaging and distribution functions, and some of the largest become registered with the Canada Department of Agriculture as egg station operators. Large producer-distributors could increase their relative importance in egg marketings

TABLE 3—GROSS MARGIN AND OPERATING EXPENSES AS PERCENTAGES OF TOTAL NET SALES OF POULTRY PRODUCTS WHOLESALERS, CANADA, 1961

	Unincorporated	Incorporated	Co-operatives
	per cent		
Gross margin.....	12.88	13.55	—
Total operating expense.....	10.17	12.34	17.06
Net operating profit.....	2.71	1.21	
Selling expense.....	1.35	1.23	0.62
Warehouse and delivery.....	5.35	7.00	11.76
General and administrative.....	3.23	4.00	4.60
Other operating expense.....	.24	0.11	0.08

Source: Dominion Bureau of Statistics, *1961 Census of Merchandising, Wholesale Trade*.

because they appear to have greater opportunity to reduce unit marketing costs. The costs of assembly are completely eliminated and wage rates in rural areas are generally lower than in the urban sector. Assembler-distributors also have some of these advantages.

In addition to the direct competition of producers, wholesalers have also been challenged by the integration of the wholesale function by some chain retailers, who operate their own egg stations and procurement programs. To better meet the competition of producer-distributors and of chain retailers, egg wholesalers have been integrating the assembly and distribution functions by organizing their own procurement programs. These programs feature marketing agreements with larger producers and stress the quality control aspects of egg production

and handling. Some marketing agreements with producers incorporate risk-sharing terms with respect to price, while others incorporate a formula pricing arrangement in which producer settlement prices are tied to the wholesale to retail cartoned price. Further mechanization of the grading and packaging operations are also being undertaken to reduce unit processing costs. These changes in the policies and programs of egg wholesalers will likely retain for them an important role in Canada's egg marketing system.

REFERENCES

- (1) Dominion Bureau of Statistics, *1961 Census of Canada, Wholesale Trade*, Series 6.2, Catalogue 97-511 to 97-516, April 6, 1966 to June 30, 1967, Ottawa.
- (2) Dominion Bureau of Statistics, *Production of Poultry and Eggs*, 1966, Catalogue 23-202, Ottawa.
- (3) Canada Department of Agriculture, *Poultry Market Review*, 1961, Ottawa.

POLICY AND ADMINISTRATION OF PUBLIC LANDS IN BRITISH COLUMBIA WITH PARTICULAR REFERENCE TO AGRICULTURE

R. A. Stutt⁽¹⁾

The majority of public lands in British Columbia is administered by the Lands Service of the Department of Lands, Forests, and Water Resources. However, large areas of forested lands are administered by the Forest Service of this same Department and recreational lands are administered by the Parks Branch of the Department of Recreation and Conservation.

The Lands Service therefore manages the majority of all public lands not within Provincial Forest Reserves, Park Reserves and lands acquired in fee ownership through conveyance by various departments of the provincial Government. Although Crown lands within a Provincial Forest are administered by the Forest Service, Crown lands which have a higher economic use than for the growing of forest crops may be removed from a Provincial Forest and dealt with under the Land Act. The Parks Branch of the Department of Recreation and Conservation administers land in Provincial Parks under "Park Use Permit", e.g., for grazing.

For the most part, lands within a Forest Reserve are not suitable for agricultural development except for grazing purposes. Such lands are generally rough and mountainous.

The Provincial Crown lands in British Columbia are administered, controlled and managed under the authority of the Land Act, Revised Statutes of British Columbia, 1960, Chapter 206; 1961 Chapter 32, Chapter 31; 1965, Chapter 21; 1966, Chapter 23, This Act is being considered for revision and several changes in policy are expected.

British Columbia is participating in the Canada Land Inventory and the results of these studies will be given careful consideration by the Department when the studies have been concluded. It is anticipated that these results will prove beneficial in land use planning programs.

The Land Act requires that surveyed Crown lands be classified as Timber lands and first, second or third-class lands. Open and easily cleared lands suitable for cultivation and wild hay meadow lands are deemed to be first class lands. All other lands that are capable of being brought under cultivation are classified as second class lands. Land containing specified milling timber in specific parts of the Province are classified as Timber land. The balance of the land is classified as third class land.

The distribution of land area in British Columbia is shown in Table 1. Provincial lands make up about 94 per cent of the total area, including 3 per cent in Provincial parks and almost 21 per cent in Forest

TABLE 1—TOTAL AREA OF BRITISH COLUMBIA BY TENURE AND USE

	Square Miles	Per Cent
Total Land Area.....	359,279	98.1
Total Fresh Water Area.....	6,976	1.9
Total Area of Province....	366,255	100.0
Tenure in 1966 ^a		
Federal Lands:		
National Parks.....	1,671	0.5
Indian Reserves.....	1,282	0.3
Other.....	502	0.1
Total.....	3,455	0.9
Provincial Lands:		
Provincial Parks.....	10,023	2.7
Forest Reserves.....	76,078	20.8
Other.....	256,527	70.0
Total.....	342,628	93.5
Privately owned land or land in process of alienation from the Crown.....	20,172	5.6
Total Area in Province....	366,255	100.0
Use of Land Area in 1962 ^b		
Occupied Agricultural Land:		
Improved.....	2,035	0.6
Unimproved.....	5,006	1.4
Total.....	7,041	2.0
Forested Land:		
Productive.....	207,234	57.7
Non-productive.....	59,227	16.5
Total.....	266,461	74.2
Other.....	85,777	23.8
Total Land Area.....	359,279	100.0

Sources: ^aLands Service, B.C. Department of Lands, Forests and Water Resources.

^bDominion Bureau of Statistics, *Canada Year Book, 1963-64*, page 31.

Reserves. Much of the balance of Provincial lands is remote and inaccessible. Privately owned lands in the Province amount to only 5.6 per cent and federal lands of various categories amount to only 0.9 per cent. In terms of present land use, the main category is forest land, involving extensive acreages of merchantable timber. Almost one-quarter of the total land area is classed in part as 'other', being swamp, rock and waste.

Occupied agricultural land in farms amounts to 2 per cent of the land area of which only 30 per cent is designated as improved land. Most of the improved land is concentrated in the Fraser Valley.

DISPOSITION

The Lands Service can alienate by purchase, lease, pre-emption or by right-of-way agreement for pipeline and power line purposes. They also enter into exchange agreements with private individuals or companies where it is in the public interest to do so. The Forest Service and the Parks Branch, on the other hand, cannot convey title, and the land under their jurisdiction can be used under permit only. Permits are issued for grazing, cabin sites, roads, etc.

For purposes of defining the location of, and describing lands, the Province is divided into Land Recording Districts. Applications to acquire Crown lands are submitted through the local Land Commissioner to the Lands Service where final adjudication is made.

When the demand warrants and it is considered in the public interest to do so, it is Departmental policy to offer desirable parcels of Crown land for sale or lease by auction or tender.

Leases of unoccupied and unreserved Crown lands may be granted by the Lands Service for three main purposes (a) cutting of hay, (b) any purpose whatsoever, except cutting of hay or cutting and removal of trees, and (c) for any industrial or special purposes.

The Lands Service has a field staff of 33 fieldmen (21 Land Inspectors and 12 Deputy Land Inspectors), a Chief Land Inspector and an Assistant Chief Land Inspector under the administration of the Director of Lands.

Agricultural lands

The present policy is to dispose of land for agricultural purposes on a leasehold basis, and only land which is at least 50 per cent arable will be alienated. No person is entitled to lease more than 1,280 acres of Crown land for agricultural purposes at any one time. Such lands may be obtained for a period of 3 years subject to renewal for a further period of up to 18 years with an option to purchase. The purchase price of the land, which is based on current market values, is established at the time the lease is issued, and the option must be exercised within the first 10 years of the lease. When 80 per cent of the arable acreage within each 640 acre parcel has been cleared and cultivated the lessee may apply to purchase the land. The policy might be described as "lease-develop-purchase" and was introduced in 1965 for the purpose of encouraging the development of Crown land and to reduce speculation to a minimum. This policy has been extended where practical to public lands alienated for industrial, commercial, and residential (other than waterfront) purposes. To qualify for renewal, the lessee of agricultural lands must clear and cultivate a minimum of 10 per cent of the arable

acreage within the first 3 years of the lease. Consideration will not be given to the assignment of the lease until the lessee has cleared and cultivated a minimum of 20 per cent of the arable acreage.

The annual rental for Crown agricultural leases is based on 5 per cent of the market value of the land at the time the lease is granted and is subject to review and adjustment at the end of each 5-year period thereafter, during the term of the lease.

Persons may pre-empt surveyed vacant Crown land which is predominantly arable. An application to pre-empt must not exceed 160 acres in extent. The pre-emptor is entitled to a Crown grant of the land upon payment of a fee of \$10 and following completion of all conditions as to occupancy and development. Persons who have obtained Crown grants under their original pre-emption claim, homesteaders of a soldier grant entry or Crown grant within the Railway Belt or the Peace River Block, and who can prove that they require additional land for agricultural purposes in conjunction with their farms, may obtain an additional pre-emption of land.

Grazing lands are administered, for the most part, by the Forest Service under the Grazing Act. Occupation is on a permit basis. However, the Lands Service will issue grazing leases for periods up to 21 years, where it is in the public interest to do so, and providing there is no interference with range use. Such leases will only be issued following an examination of the land by a member of the Inspection Division.

Grazing permits are issued annually and contain a permissive right to graze a specific number of animals for a definite period on Crown range. The permit fee is expressed as a monthly rate per head of stock.

Residential lands

Leases of non-waterfront Crown land for residential purposes may be obtained for a period of 3 years subject to renewal for a further period up to 7 years with an option to purchase. The maximum area that may be obtained is 10 acres, and an annual rental is payable based on 5 per cent of the market value.

When the lessee has constructed a habitable dwelling on the area, the lessee may exercise his option to purchase the land at the appraised value established at the time the lease is issued.

Waterfront lands

Residential and commercial leases fronting on a lake or the ocean may be obtained by leasehold tenure only for a term of 21 years. These leases do not contain an option to purchase. The amount of frontage which may be leased for residential purposes is 100 feet. The maximum amount of frontage that may be obtained for commercial purposes is

660 feet. Again the annual rental for such leases is based on 5 per cent of the market value, subject to review and adjustment at the end of each 5-year period during the term of the lease.

Forested lands

The disposition of forested lands is restricted, but the timber on the land may be harvested under various forms of licence which are administered by the Forest Service.

Farm woodlots up to 640 acres in extent may be acquired by bona fide farmers upon meeting certain conditions. A farm woodlot must be appurtenant to the farm property and cannot be sold, transferred, assigned or otherwise disposed of separately.

LAND CONTROL RESTRICTIONS

The Lands Branch makes land available to public institutions and to Municipalities for municipal purposes for a nominal sum, but such grants contain restrictive covenants confining the use of such lands to the purpose for which the grant was given, for example, "for school purposes only", or "for park purposes only".

The statutory authority for zoning within organized areas is provided for in the Municipal Act but responsibility for enforcement rests with the local governing authority which may be either a Municipality, Regional District or a Community Planning Area.

ACKNOWLEDGEMENTS

- (1) This article was reviewed by officials of the British Columbia Department of Lands, Forests and Water Resources with particular concern to current Lands Service policy.

POLICY AND PROGRAM DEVELOPMENTS

Dairy Subsidy Quotas—The Canadian Dairy Commission announced that farmers who delivered between 12,000 and 50,000 pounds of manufacturing milk testing 3.5 per cent, or the equivalent in cream, between April 1, 1967 and March 31, 1968, will be eligible for federal dairy subsidy quotas in the year starting April 1, 1968, if they are full-time farmers and if milk and cream represents an appreciable part of their farming operations. The Commission stressed that the rate of subsidy will be conditional on funds provided by the Government.

At the end of the dairy year, March 31, 1968, any quota available for distribution will be used primarily to provide quota adjustments for those in the intermediate level of production. Some will also go to those who entered dairying during the dairy year 1967-68. This is the last year newcomers may receive subsidy quotas except by reallocation. Such reallocation quotas must be for not less than 100,000 pounds of milk or 3,500 pounds of butterfat.

The Commission stressed that quotas were related only to subsidy payments and were not a restriction on the amount which anyone could produce and sell, at the market price. (January 15, 1968)

Ontario Tender Fruit Growers' Marketing-for-Processing Order—The Ontario Tender Fruit Growers'

Marketing Board received authority by Order in Council to collect levies at the rate of \$4.00 per ton of Bartlett pears marketed, \$4.00 per ton of cherries marketed, \$2.00 per ton of Kieffer pears marketed, \$2.00 per ton of peaches marketed and \$2.00 per ton of plums marketed for the period up to December 31, 1968. (February 8, 1968)

Ontario Grape Growers' Marketing-for-Processing Order—An Order in Council authorized the Ontario Grape Growers' Marketing Board to collect levies at the rate of \$5.00 per ton of grapes marketed for the period up to December 31, 1968. (February 8, 1968)

Crop Insurance—An Order in Council extended the list of cultivated agricultural crops eligible for insurance under the Crop Insurance Act. The list now includes the following crops: wheat, oats, barley, rye, flaxseed, corn, buckwheat, soybeans, potatoes, sugar beets, tobacco, sunflower, rapeseed, mustard, apples, pears, peaches, plums, prunes, cherries, apricots, strawberries, grapes, raspberries, loganberries, blueberries, cranberries, tomatoes, spinach, broccoli, brussel sprouts, cauliflower, cabbage, peas, beans, and forage. (February 8, 1968)

PUBLICATIONS

ECONOMICS BRANCH PUBLICATIONS

1964-65 to 1966-67 Supplement to Federal Agricultural Assistance Programs, Canada, 1945-1956, Economics Branch, Canada Department of Agriculture, Ottawa, 1968. pp. v + 370 to 418.

This fifth supplement to the bulletin, **Federal Agricultural Assistance Programs, Canada, 1945-1956**, is a summary of agricultural assistance programs of the federal government, including expenditures, during the years 1964-65 to 1966-67.

Provincial Agricultural Legislation in Ontario, 1967, Economics Branch, Canada Department of Agriculture, Ottawa, February, 1968. pp. iv + 42.

This is a summary of provincial agricultural legislation in Ontario on the statute books at December 31, 1966.

Farm Credit Legislation in Canada, Rust, R. S., Economics Branch, Canada Department of Agriculture, Publication 1360, Ottawa, 1967. pp. 14.

A brief description of the development of agricultural credit in Canada and summaries of all

present federal and provincial farm credit legislation, are included in this publication.

UNITED NATIONS PUBLICATIONS

Available in Canada from the Queen's Printer,

Economic Aspects of Treatment and Disposal of Certain Industrial Effluents, United Nations Publication, Geneva, 1967. pp. 460, 3 volumes. Price: U.S. \$5.00.

This is a collection of papers and case studies presented at the meeting of Experts for the study of Economic Aspects of Water Pollution Control Problems convened by the Economic Commission for Europe from November 7 to 11, 1966.

The papers concern measures to improve techniques of treatment and disposal of industrial effluents, and the reduction of costs of such measures.

FAO Rice Report 1967, Rice Section, Commodities Division, Department of Economic and Social

Affairs, Food and Agriculture Organization, Rome, 1967. pp. ii + 36.

This publication, the eighteenth in a series of annual reports, describes the world rice situation and outlook, based on statistics and information available up to August 1967.

Young World Food and Development Project, Food and Agriculture Organization of the United Nations, Rome, 1968. pp. v + 33.

A summary report of the World Conference held in Toronto, Canada, September 11 to 15, 1967.

Soil Erosion by Water: Some Measures for its Control on Cultivated Lands, Food and Agriculture Organization, Rome, 1965. pp. xxi + 284.

This book deals with the fundamental causes of water erosion and with the methods of control that are successfully used in the United States. Appendices deal with the viewpoints and practices in Australia, Ghana, South Africa, Southern Rhodesia, Greece, Israel and Somalia.

OTHER PUBLICATIONS

Not available from Economics Branch

Canadian Journal of Agricultural Economics, Vol. 16, No. 1, February, 1968. Published three times a year by the Canadian Agricultural Economics Society. Copies available from the Society at Box 632, Postal Station B, Ottawa 4, Ontario, Canada. Single copies \$3.75. Annual subscription \$7.50.

Contents of the February, 1968 issue include the following articles by members of the Society:

A Capital Budgeting, Mixed Integer, Temporal Programming Model.

Regional Planning for Depressed Rural Areas: The Canadian Experience.

Agricultural Development and Adjustment Policy for Low Income Farm Areas.

The Adoption of Dairy Practices.

An Economic Analysis of the Alberta Butter Industry.

Evaluating the 1966 Agricultural Census.

Grain Transportation in Canada. Some Critical Issues and Implications for Research.

Production Possibilities for Grain in Western Canada.

Projecting Canadian Grain Flows.

Branch Line Abandonment: Death Knell for Prairie Farms.

Economic Growth in Agriculture: A Comparative Analysis of Two Agricultural Areas in Alberta, Manning, Travis W. and George Buckmire, Agricultural Economics Research Council of Canada, November 1967. pp. ix + 40. Price \$2.00.

A report of a study of two agricultural areas in Alberta to discover reasons for different rates of economic growth.

1966 Alberta Cow-Calf Enterprise Analysis, Hackett, B. A., Alberta Department of Agriculture, Publication No. 816/420-5. pp. 65 and appendix.

This report of a study of the costs and returns of 98 cow-calf enterprises in Alberta is designed to aid farmers and extension workers in establishing guidelines to assess their operations and to improve their efficiency.

1966 Alberta Hog Enterprise Analysis, Hackett, B. A. and A. Reddon, Alberta Department of Agriculture, Publication No. 816/440-2. pp. 51.

This report is an analysis of the data received from the records of 37 hog producers participating in the Alberta Farm Business Analysis program in 1966.

Dollars and Sense in Machinery Buying, Jones, A. R., Economics Division, Alberta Department of Agriculture, Publication No. 825-7, 1968. pp. 46.

An outline of the factors to be considered when buying farm machinery, including investment, trade-in, size, depreciation rates and tax implications.

STATISTICAL APPENDIX

AVERAGE PRICES OF SELECTED CANADIAN FARM COMMODITIES, VARIOUS MARKETS AND GRADES, 1967-68

Commodity, grade and market	1967					1968	
	Average	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
dollars per cwt.							
CATTLE (weighted average prices at public stockyards)							
Good slaughter steers							
Toronto.....	27.65	28.60	28.74	28.50	28.09	27.28	26.30
Winnipeg.....	26.60	28.57	28.47	28.63	27.88	26.38	25.42
Calgary.....	26.05	27.78	27.85	27.23	26.89	25.22	24.53
Good feeder steers							
Toronto.....	28.70	29.50	28.53	28.50	28.50	27.51	27.00
Winnipeg.....	26.55	26.92	25.96	25.90	25.98	23.90	25.43
Calgary.....	26.40	27.12	27.14	26.38	26.00	24.81	25.12
Good and choice veal calves							
Toronto.....	36.15	32.30	33.66	35.13	37.62	39.44	38.96
Winnipeg.....	38.85	38.05	36.30	35.20	39.22	39.66	40.83
Edmonton.....	30.40	26.88	23.94	24.00	26.90	29.85	30.68
HOGS (weighted average prices at public stockyards, Grade A dressed)							
Toronto.....	30.70	30.08	29.23	27.73	28.74	28.11	28.60
Winnipeg.....	28.55	28.65	27.87	26.35	26.86	25.78	26.40
Calgary.....	27.05	26.77	26.17	25.47	25.55	24.19	24.71
LAMBS (weighted average prices at public stockyards, Good lambs)							
Toronto.....	26.65	26.59	25.27	24.84	25.36	27.37	27.26
Winnipeg.....	21.40	20.36	20.00	18.54	19.95	23.00	23.41
Calgary.....	20.40	18.71	19.53	17.75	18.66	20.08	21.44
FLUID MILK (f.o.b. factory)							
Halifax.....	6.24	6.45	6.45	6.45	6.45	6.45	6.45
Montreal.....	5.96	6.00	6.00	6.00	6.00	6.00	6.00
Toronto.....	5.98	6.10	6.10	6.10	6.10	6.10	6.10
Winnipeg.....	5.84	5.97	5.97	5.97	5.97	5.97	5.97
Vancouver.....	6.93	7.08	7.09	7.13	7.16	7.17	7.20
MANUFACTURING MILK (average farm value) ^a							
Nova Scotia.....	3.14	3.20	3.24	3.29	3.30	—	—
New Brunswick.....	3.10	3.08	3.08	3.16	3.15	—	—
Quebec ^b	3.31	3.31	3.31	3.34	3.54	—	—
Ontario ^c	3.36	3.40	3.58	3.64	3.59	—	—
British Columbia.....	3.40	3.41	3.40	3.40	3.42	—	—
BUTTERFAT (for butter, average farm value) ^a							
Prince Edward Island.....	67.7	68.0	68.0	68.0	68.0	—	—
Quebec ^b	89.7	89.5	88.5	87.8	87.9	—	—
Ontario ^c	83.7	81.4	81.5	81.5	84.7	—	—
Saskatchewan.....	62.5	62.8	63.0	63.0	62.6	—	—
British Columbia.....	85.6	85.8	85.8	85.8	85.8	—	—
cents per doz.							
EGGS (average paying prices at registered grading stations, Grade A Large)							
Halifax.....	36.3	39.5	40.2	40.0	41.5	30.8	30.2
St. Anselme.....	35.5	37.0	38.3	36.1	36.2	31.8	29.2
London.....	33.4	35.2	36.0	32.7	33.5	30.1	28.8
Winnipeg.....	26.9	30.0	27.9	27.2	28.1	23.5	23.1
Vancouver.....	30.2	31.0	28.4	29.0	30.0	29.4	32.5
cents per lb. live							
BROILERS (average prices paid to growers No. 1 grade chicken under 5 lbs.)							
Toronto.....	19.6	19.0	19.2	19.9	20.5	20.8	20.5
Edmonton.....	21.0	20.2	20.8	21.5	21.5	21.5	21.5
TURKEYS (average prices paid to growers, No. 1 grade, 12-20 lbs.)							
London.....	23.7	24.0	24.9	24.8	25.2	22.6	23.0
Edmonton.....	25.4	25.0	25.5	25.5	25.5	25.5	—

AVERAGE PRICES OF SELECTED CANADIAN FARM COMMODITIES, VARIOUS MARKETS AND GRADES, 1967-68
(Concluded)

Commodity, grade and market	1966-67	1967				1968	
	Crop Year Average	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
dollars per cwt.							
POTATOES (Can. No. 1 Table, average prices to growers)							
Prince Edward Island.....	1.21	1.20	1.37	1.37	1.10	1.57	1.20
New Brunswick.....	1.00	1.03	1.38	1.28	1.12	1.73	1.03
Southwestern Ontario.....	1.70	1.92	1.97	2.03	2.05	2.08	1.95
cents & eights per bu.							
EASTERN GRAINS							
Oats (Ont. No. 2 White, f.o.b. shipping points).....	82/2	85	85	85	85	85	85
Barley (Ont. good malting, f.o.b. shipping points).....	145	145	145	145	145	145	145
Corn (Ont. No. 2 Yellow, f.o.b. Chatham, 15% moisture, in carlots).....	152/6	149/2	132/2	124/4	126	128/3	131
Soybeans (Ont. No. 2, f.o.b. Chatham).....	306/6	295/1	287/5	275	271/5	273/7	276
WESTERN GRAINS (basis in store Fort William/Port Arthur, less freight and elevator handling charges)							
Red Spring Wheat (No. 2 Nor.)							
Winnipeg.....	195/6	178/5	180/2	176/2	177/3	177/4	177/6
Regina and Edmonton.....	192/2	175/1	176/6	172/6	173/7	174	174/2
Durum Wheat (No. 1 C.W.A.D.)							
Winnipeg.....	213	218/7	213/5	209/2	210/3	202/2	194/2
Regina and Edmonton.....	209/4	215/3	210/1	205/6	206/7	198/6	190/6
Feed Wheat							
Winnipeg.....	177/3	163/5	165/2	161/2	162/3	162/4	162/6
Regina and Edmonton.....	173/7	160/1	161/6	157/6	158/7	159	159/2
Oats (No. 1 feed)							
Winnipeg.....	79/4	83/1	82/3	82/6	82/2	82/7	82/5
Regina.....	77/4	81/1	80/3	80/6	80/2	80/7	80/5
Edmonton.....	75/4	79/1	78/3	78/6	78/2	78/7	78/5
Barley (No. 1 feed)							
Winnipeg.....	117/1	113/3	111/5	111/5	111/3	111/6	112
Regina.....	114/1	110/4	108/6	108/6	108/3	108/6	109
Edmonton.....	111/2	107/5	105/7	105/7	105/5	106	106/2
Rye (No. 2 C.W.)							
Winnipeg.....	125/2	118/1	118/5	118	117/6	121/3	124/7
Regina.....	121/6	114/6	115/2	114/5	114/3	118	121/4
Edmonton.....	118/5	111/4	112	111/3	111/1	114/6	118/2
Flaxseed (No. 1 C.W.)							
Winnipeg.....	291/3	336/4	323/7	335/4	336/4	339/4	339/5
Regina.....	288/1	333/2	320/5	332/2	333/2	336/2	336/3
Edmonton.....	284/5	329/6	317/1	328/6	329/6	332/6	332/7
Rapeseed (No. 1 C.W. basis in store Vancouver).....	278/1	237/6	231/4	232/2	235/6	233/2	232/3

^aSince the average farm values for manufacturing milk and butterfat published by the Dominion Bureau of Statistics (D.B.S.) do not include the Federal subsidies as of April 1, 1966, it is necessary to add, during the 12-months' period ended March 31, 1967, the Federal payment of 85¢ per 100 pounds of milk testing 3.5% butterfat to obtain the full returns to producers. Ten cents was retained for export aid. The net payment of 75¢ per cwt. was made directly to farmers, at the equivalent rate of 21.43 cents per pound of butterfat. Since the end of the dairy year a rebate of 2.7¢ per cwt. from the export assistance holdback has been paid to dairy farmers.

Federal subsidies for the 12-months' period April 1, 1967 to March 31, 1968 amount to \$1.21 per cwt. of milk testing 3.5% butterfat, of which 11¢ are retained for export aid. The net payment per cwt. is again made directly to producers at the equivalent rate of 31.42 cents per pound of butterfat.

^bIn the Province of Quebec, and beginning April 1, 1966, full producer returns consist of the published D.B.S. average farm values for manufacturing milk and butterfat, plus the Federal payment (see footnote ^a), plus a payment made by the Quebec Government. This payment is made on butterfat at the rate of 5¢ per pound from April 1 to September 30 and at the rate of 10¢ per pound from October 1 to March 31. Prior to April 1, 1966, this payment, which began in October, 1964, was made through factories and was part of the producer's farm value. It terminated on March 31, 1967.

^cIn the Province of Ontario, and beginning October 1, 1966 until March 31, 1967 full producer returns consist of the published D.B.S. average farm values for manufacturing milk and butterfat, plus the Federal payment (see footnote ^a), plus a payment made by the Ontario Government. The payments amount to 25¢ per hundredweight (7.14¢ per pound butterfat) of manufacturing milk and secondary and excess fluid milk delivered to plants, basis 3.5% butterfat. For all cream grading Special and/or No. 1, the payment is 10¢ per pound butterfat.



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CANADIAN FARM ECONOMICS

Commodity Review.....	1
The Grain Corn Enterprise in Eastern Ontario, 1967 V. A. Heighton	4
Manufacturing Milk and Cream Production in Canada W. J. White and V. A. Heighton	9
Other Sources of Income on Cream and Manufacturing Milk Producing Farms in Canada. W. Y. Yang	15
Structural Changes in the Cattle Enterprises of the Prairie Provinces..... W. J. Lockhart	17
Policy and Program Developments.....	22
Publications.....	22
Statistical Appendix.....	24

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CANADIAN FARM ECONOMICS

COMMODITY REVIEW

OILSEED SITUATION AND OUTLOOK

The main factors currently affecting the Canadian oilseed situation are the strengths of the domestic and foreign markets and these two are closely related. In general, the situation for oilseeds is one in which world production is growing even faster than the rising world consumption. There are a large number of different oil crops produced in different parts of the world and although each has some special characteristic, most of the edible vegetable oils are readily substitutable one for another. Animal and marine oils and fats provide further competition. Canada produces three edible vegetable oilseeds—rapeseed, soybeans and sunflower—and one specialized non-edible oilseed—flaxseed.

Flaxseed

World production of flaxseed has fallen from an average of 138 million bushels in the period 1963–65 to 121 million in 1966 and 99 million in 1967. This downward trend has occurred in all the major flaxseed producing countries, Canada, the United States, Argentina and India, except the largest producer, Russia, where in 1967, the crop reached a record 27 million bushels.

Production in Canada in 1965 was 29 million bushels; in 1966, 22 million; and in 1967, 10 million. Canadian exports of flaxseed, linseed oil and linseed meal all showed sizeable declines from 1966 to 1967. Flaxseed exports amounted to almost 14 million bushels in 1967, down 31 per cent from the 20 million bushels of 1966 but down only 2 per cent from the 1963–65 average. Thus production in 1967 was below the quantity of flaxseed exported without taking into account exports of oil and meal. Linseed oil exports in 1967 at 8.9 million pounds were down 28 per cent, and meal exports at 16.1 million pounds were down 46 per cent.

Although production and exports were considerably lower in 1967, domestic crushings of flaxseed were only 4 per cent lower at 133 million pounds compared

with 138 million pounds in 1966 and the 1963–65 average of 155 million pounds.

The decline in the world demand for linseed oil has resulted from the development of cheaper substitutes which are now used extensively in the manufacture of paints and linoleum where formerly large quantities of linseed oil were used. Many uses for linseed oil still remain; one of the chief of these is in printer's ink. In addition, linseed oil is used for special lubricating purposes.

In spite of the downward trend in demand during recent years, the unusually sharp decline in production of flaxseed in 1967 led to a firming of prices, which had also declined. As stocks dwindled toward the end of 1967 and early 1968, prices rose appreciably. In 1966, the average price for flaxseed No. 1 C.W. in store Port Arthur/Fort William was \$2.96 per bushel down from the 1963–65 average of \$3.23 per bushel. The average price in 1967 increased to \$3.20 and at May 2, 1968 was \$3.47 per bushel.

Canadian farmers' seeding intentions for 1968 were 1,362,000 acres, about 23 per cent up from the 1,107,000 acres in 1967. The United States acreage is expected to increase from 2.08 million acres to 2.27 million. This anticipated increase in Canadian and United States production should result in North American production 8–9 million bushels more than in 1967. This would amount to an increase of about 76,000 metric tons of oil. However, by July 1, 1968, North American flaxseed stocks will have decreased from 21 million to 10 million bushels, and linseed oil stocks will have decreased by 88,000 metric tons. Although it is too early to speculate on Southern Hemisphere production, especially the Argentine, world market supplies could be inadequate for 1968. In mid-April, linseed oil prices in the key European market of Rotterdam were 10 per cent higher than the average price for 1967 and 17 per cent higher than in 1966. With supplies likely to be low relative to demand for the next year or so, prices should remain firm. Canada's export prospects for flaxseed should remain relatively good although world trade in total will continue to diminish.

Edible Vegetable Oils

Unlike world flaxseed production, world production of the three edible oils produced in Canada reached record levels in 1967. World production of rapeseed totaled 5.4 million metric tons (about 2.4 billion bushels), some 15 per cent larger than in 1966. Production in Poland increased from 20 million bushels in 1966 to 31 million in 1967; in Sweden, production increased from 3.6 million bushels in 1966 to over 9 million in 1967; in France, from 14 million bushels in 1966 to almost 18 million; and in West Germany, from 4 million bushels in 1966 to 5.5 million.

World soybean production in 1967 also reached a record, and world imports amounted to almost 300 million bushels, up 7 per cent from 1966 and 27 per cent from 1965. However, in the United States, the major exporter, there was a record crop of 973 million bushels, and for the first time, a carryover of soybeans of nearly 100 million bushels.

The world sunflower seed crop in 1967 set a record at 9.5 million metric tons, following the previous bumper crop of 1966 of 9.3 million metric tons. Russia accounts for two-thirds of the world production, Argentina for 10 per cent, and Rumania and Bulgaria together, for a little over 10 per cent.

The world situation for other vegetable oils is of significance, including such vegetable oils as coconut oil, peanut oil, corn oil, palm oil, palm kernel oil and cottonseed oil. Among these, peanut oil production was at a new record high in 1967. All of these oils are used in Canada for margarine, salad or cooking oils and, to quite an extent are substitutable. While in total, imports of these oils into Canada have been increasing, exports of Canadian-grown oilseeds have also expanded.

Rapeseed exports particularly, have increased in recent years (Table 1). While in 1967, exports at 14.8 million bushels were 6 per cent larger than the 14 million bushels of 1966, they were more than twice as large as the average for 1963-65. Soybean exports were lower in 1967 compared with 1966, but slightly higher than the average level for the previous 3 years. Soybean oilcake and meal exports were down about 20 per cent from 1966, but soybean oil exports were higher by 47 per cent, although only 23 per cent higher than 1963-65 levels. Exports of sunflower seed are not important. Rapeseed exports to Japan have been of particular significance, although Italy and some other European Economic Community countries have taken substantial quantities. Soybeans and products have been exported largely to the United Kingdom.

Imports of oilseeds and products have usually been confined to soybeans and its products. In 1967, imports of soybeans amounted to a little over 16 million

TABLE 1—CANADIAN EXPORTS OF EDIBLE OILSEEDS AND PRODUCTS

	Average 1963-65	1966	1967
million bushels			
Rapeseed	6.8	14.0	14.8
Soybeans	2.2	3.3	2.4
Sunflower seed	0.4	0.6	0.2
million pounds			
Soybean cake and meal ..	48.4	42.4	34.2
Soybean oil	35.0	29.2	42.9

Source: *Trade of Canada*, Dominion Bureau of Statistics.

bushels, up slightly from the previous year and about the same as the previous three-year average. Imports of soybean oilcake at 220,000 tons were also slightly higher than in 1966, although down slightly from the 1963-65 average of 243,000 tons. Soybean oil imports at 23 million pounds were down by more than 1 million pounds from the previous year and more than 8 million pounds less than the previous three-year average. These declines in imports are the result of increased Canadian production and crushings.

One relatively new development of considerable significance in 1967 was the importation of some 34 million pounds of sunflower seed oil. In 1966, another new development was the importation of rapeseed oil in quantities estimated at over 20 million pounds.

Domestic production of edible oilseeds in Canada indicated a record production of rapeseed and production of soybeans and sunflower seed at relatively high though not record levels (Table 2). Of particular significance has been the increase in rapeseed production compared with earlier years.

TABLE 2—PRODUCTION OF RAPESEED, SOYBEANS AND SUNFLOWER SEED, CANADA

	Average 1963-65	1966	1967
thousand bushels			
Rapeseed	14,730	25,800	26,500
Soybeans	6,669	9,012	8,091
thousand pounds			
Sunflower seed	33,321	39,270	36,010

Source: Dominion Bureau of Statistics.

Canadian crushings of all edible oils increased in 1967. While for soybeans the increase was a moderate one, for rapeseed the increase was very sizeable at 250 million pounds compared with the 1963-65 average of 100 million pounds. Soybean crushings still comprise about 80 per cent of the total edible oil crops crushed, but the lower oil content of soybeans has increased the proportion of rapeseed oil to almost one-third of total oil production (Table 3).

TABLE 3—CRUSHINGS OF OILSEEDS AND PRODUCTION OF OIL AND MEAL, CANADA

	Crushings			Oil Production			Oil Meal Production		
	Average 1963-65	1966	1967	Average 1963-65	1966	1967	Average 1963-65	1966	1967
	million pounds								
Rapeseed.....	99.7	213.6	251.2	39.0	84.4	100.9	58.3	122.9	142.0
Soybeans.....	1,140.0	1,203.2	1,262.4	195.3	197.9	215.5	901.3	951.5	1,006.0
Sunflower seed.....	16.0	12.0	17.1	5.3	4.4	6.8	5.6	4.6	6.4

Source: Dominion Bureau of Statistics.

Prices of rapeseed and soybeans have followed world prices in reacting to the heavy market supplies noticeable in the last year (Table 4). Prices for rapeseed have been reduced with prices in early May, 1968, 25 per cent below the average for 1966. Soybean prices were about 11 per cent below 1966 prices. Sunflower seed is largely grown under contract.

TABLE 4—EDIBLE OILSEED PRICES, CANADA

	Average			May 2, 1968
	1963-65	1966	1967	
	dollars			
Rapeseed, No. 1 Can. in store Vancouver.....	n.a. ^a	2.78	2.62	2.09
Soybeans, No. 2 or better, f.o.b. Chatham.....	2.89	3.17	2.94	2.71

^aNot available in earlier years.

Source: Dominion Bureau of Statistics.

TABLE 5—OILSEEDS, ACREAGE INTENTIONS 1968, AND ACTUAL ACREAGES 1967

	1968 Intended Acreage	1967 Acreage	Percentage Change
	thousand acres		
Rapeseed.....	1,361	1,726	-21
Soybeans.....	302	290	+ 4
Sunflower seed.....	n.a.	46	

Source: Dominion Bureau of Statistics.

The outlook for rapeseed is very mixed. In E.E.C. countries, further increases in production are expected under the stimulation of the producer subsidy of about \$100 per metric ton as from July, 1967. Commencing at the same time an additional import tax was added to the levy on certain oilseeds and oils

entering Italy. In the current crop year to the end of March, Canada had sold practically no rapeseed to the E.E.C. countries, whereas in the same period in 1967, sales to Italy had amounted to 2.4 million bushels. While the E.E.C. countries are still deficit areas for oils and sales could be made before the new crop is harvested, the prospects for Canadian rapeseed in this market have become poor. However, sales to Japan this crop year have continued to increase and Taiwan recently has imported about 1 million bushels. The Canadian domestic market is also favorable. The overall situation is thus mixed and the total world supply situation would seem to indicate the likelihood of relatively low prices continuing in the immediate future on world markets.

The Canadian price for soybeans is closely tied to the price situation in the United States and currently their huge crop is having a price depressing effect. For the United States, exports have been higher than last year and are likely to exceed 280 million bushels in the current crop season. The U.S. domestic crush is up 23 million bushels and could reach 580 million for the year. Nearly 200 million bushels are currently held out of circulation through loan, resale or Commodity Credit Corporation ownership. Planting intentions in the United States indicate that acreage will increase by 3 per cent over that in 1967. The large stocks of soybeans in the United States suggest that prices are likely to remain close to the support level of U.S. \$2.50 per bushel. Canadian prices should hold reasonably stable at about their current relationship to this support price.

Prices of sunflower seed crude oil in early April were as low as 7 cents per pound (U.S. funds) at Rotterdam, and 9 cents per pound in Toronto, and these low prices might have some effect on Canadian production in 1968.

J. S. Carmichael

THE GRAIN CORN ENTERPRISE IN EASTERN ONTARIO, 1967

V. A. Heighton (1)

This study of the grain corn enterprise on some farms in Eastern Ontario was initiated by the Economics Branch, Canada Department of Agriculture, in response to requests from farmers, grain corn processors and other interested agencies. Eastern Ontario imports a large volume of grain for feed from the Prairie provinces and corn for feed and industrial use from the United States. It has been suggested that these requirements could largely be supplied by farmers in this region, and at the same time these farmers, who are largely producers of manufacturing milk, would have an alternative source of income.

PURPOSE

The purpose of the study was to obtain primary data on the production of grain corn in Eastern Ontario. It was designed to provide specific information on the following:

1. General characteristics of the farm organization,
2. Costs and returns on grain corn production,
3. Grain corn cultural practices,
4. Market outlets,
5. Potential acreage for grain corn production.

METHODOLOGY

Thirty farmers in Eastern Ontario were interviewed on their grain corn enterprises covering the 1967 crop. The farms were scattered evenly among the seven counties of Carleton, Russell, Prescott, Grenville, Dundas, Stormont and Glengarry.

For purposes of analysis the 30 farm business records were grouped according to high and low costs per acre, and high and low net returns per acre. The high-cost group are those farmers whose grain corn costs per acre were higher than the mean costs per

acre. The low-cost group are those farmers whose grain corn costs per acre were lower than the mean costs per acre. The same procedure was followed for the sort on the high and low net returns per acre.

The value of land used in the cost analysis was that estimated by the farmers.

RESULTS OF THE STUDY

Eight of the 30 farmers grew grain corn solely as a cash crop, 5 fed their entire production, and the remaining 17 farmers fed some corn and sold some. The cash crop farmers had an average of 154 acres of grain corn, those growing corn only for feeding livestock on their farms averaged 86 acres, and those producing both for feeding and for sale had an average of 76 acres. Although the "cash croppers" average acreage of corn was larger than that of the other two types of corn growers in 1967, the latter two groups were expanding their acreage at a faster rate than the cash croppers.

As would be expected, the value of land close to residential areas was considerably higher than that of other land.

FARM ORGANIZATION

Land Use

Farmers in the study reported a total improved land area of 7,513 acres in 1967 (Table 1). Of this amount 5,869 acres were owned and 1,644 acres were rented. In 1966 these farmers had a total improved area of 6,469 acres of which 5,530 acres were owned and 939 acres were rented. Rented land accounted for 705 acres or 68 per cent of the increase in improved acreage, from 1966 to 1967. The average improved area per farm increased by 35 acres, to a total of 250 acres in 1967.

TABLE 1—IMPROVED LAND USE, 1966 AND 1967, AND PLANNED CORN ACREAGE, 1968

	1966			1967			1968
	Owned	Rented	Total	Owned	Rented	Total	Total Planned
	acres						
Grain corn: Total.....	1,243	314	1,557	2,258	702	2,960	5,112 ^a
Average per farm.....	41.4	10.5	51.9	75.3	23.4	98.7	170.4
Corn for silage: Total.....	637	42	679	536	66	602	495 ^a
Average per farm.....	21.2	1.4	22.6	17.9	2.2	20.1	16.5
Other grains: Total.....	448	30	478	480	217	697	
Average per farm.....	14.9	1.0	15.9	16.0	7.2	23.2	
Hay and seeded pasture: Total.....	2,661	533	3,194	2,271	579	2,850	
Average per farm.....	88.7	17.8	106.5	75.7	19.3	95.0	
Other: Total.....	541	20	561	324	80	404	
Average per farm.....	18.0	0.7	18.7	10.8	2.7	13.5	
Total improved land.....	5,530	939	6,469	5,869	1,644	7,513	
Average per farm.....	184.3	31.3	215.6	195.6	54.8	250.4	

^aProducers' estimate.

The total land in grain corn was 1,557 acres in 1966, 2,960 acres in 1967 and about 5,000 acres were planned for seeding in 1968. The average acreages per farm in grain corn for these years were 52, 99 and 170 acres, respectively.

In addition to grain corn, farmers grew corn for silage. There were 679 acres planted for silage in 1966, 602 acres in 1967, and the planned acres were 495 for 1968. The decrease in corn silage acreage may be misleading because the growers are planting grain corn which can be sold as grain or fed to livestock as silage.

The average acreage per farm in grains, other than corn, increased from 16 acres in 1966 to 23 acres in 1967. The average acreage per farm in hay and seeded pasture decreased by 1.5 acres from 1966 to 1967, and other improved land decreased by 35 acres from 1966 to 1967.

Livestock

Livestock on the farms totaled 3,435 animal units, an average of 114.5 animal units per farm (Table 2). Of this total 2,543 animal units were on farms where some of the grain corn production was fed to livestock. The average number of animal units on these farms was 115.6. Twenty-two farmers in the study fed at least part of the corn that was produced on their farms to livestock.

TABLE 2—ANIMAL UNITS PER FARM, 1967

	All Farms	Farms Feeding Corn
	animal units	
Milk cows.....	30.6	41.1
Beef cows.....	1.2	—
Other cattle.....	15.2	20.7
Pigs.....	19.3	26.4
Hens and chickens.....	45.7	25.5
Other.....	2.5	2.5
Total.....	114.5	115.6

CORN ENTERPRISE

Yield

The farmers' estimate of moisture content and yield of corn varied widely from farm to farm. Yields were calculated on the basis of 56 pounds per bushel. The total production of grain corn was 243,623 bushels, an average of 82.3 bushels per acre (Table 3). Yields ranged from a low of 50 bushels per acre to a high of 119 bushels. The second lowest yield was 63 bushels per acre.

Disposition of Crop

Most farmers have the opportunity to sell corn for cash, feed it to livestock or sell part and feed the remainder to livestock. About 36 per cent of the total

TABLE 3—RELATION OF COSTS PER ACRE TO YIELDS AND RETURNS IN THE PRODUCTION OF GRAIN CORN, 1967

	Producer Group		
	All Farms	High Cost	Low Cost
Number of farms.....	30	15	15
Average acres per enterprise.....	98.7	85.5	111.8
Yield per acre (bushels).....	82.3	84.8	80.4
	dollars		
Costs per acre			
Pre-harvest:			
labor ^a	3.03	3.35	2.78
tractor.....	3.19	3.71	2.79
machinery.....	2.93	3.46	2.53
custom work.....	2.94	2.90	2.96
materials—fertilizer, spray etc. ^b	39.03	46.71	33.18
Total pre-harvest.....	51.12	60.13	44.24
Harvesting ^c	14.18	16.67	12.27
Marketing ^d	10.63	14.13	7.97
Use of land ^e	15.48	17.33	14.06
Total cost.....	91.41	108.26	78.54
Returns			
Average price per bushel.....	1.51	1.50	1.51
Average gross income per acre.....	124.03	127.53	121.36
Net return to risk and management.....	32.62	19.27	42.81

^aTotal costs per acre of labor at \$1.50 per hour, tractors and machinery (including operating and overhead costs) and custom work for work involved in seedbed preparation, planting, and summer operations. The costs of applying fertilizer and spray are included here as well.

^bMaterials: fertilizer, manure (including application), herbicides, seed and seed treatment.

^cHarvesting costs include labor, tractors, machinery, custom work, and any materials used.

^dMarketing costs include costs as in harvesting in addition to overhead charges for corn handling and storage facilities.

^eUse of land includes interest, taxes and rent.

TABLE 4—RELATION OF NET RETURNS PER ACRE TO YIELD, COSTS AND RETURNS IN THE PRODUCTION OF GRAIN CORN, 1967

	All Farms	Producer Group	
		High Net Return	Low Net Return
Number of farms.....	30	15	15
Average acres per enterprise.....	98.7	87.7	109.7
Yield per acre (bushels).....	82.3	91.4	75.0
		dollars	
Total cost per acre.....	91.41	81.67	99.20
Price per bushel.....	1.51	1.50	1.52
Average gross return per acre.....	124.03	136.77	113.85
Net return to risk and management per acre.....	32.62	55.10	14.65

production was kept on the farm for livestock feed. The remainder was sold to processing plants, feed mills and to other farmers. The farmers who sold all their grain corn accounted for more than half of the total corn sold off farms.

Costs and Returns

A detailed analysis of the cost of production was made together with the reasons for variation in costs. The cost of some inputs and their economic effect were difficult to measure. Manure for example was applied quite heavily on corn fields where farmers maintained a livestock enterprise. The extra cost incurred by some farmers in the heavy application of manure to corn fields may not be justified by the yields obtained. However, the manure was available and it did to some extent offset the purchase of commercial fertilizer.

The average cost of producing grain corn on the 30 farms was \$91.41 an acre (Table 3). Detailed costs for the high-cost and low-cost groups of producers are shown in the same table. The pre-harvest costs accounted for 56 per cent of the total cost. Harvesting and marketing costs accounted for 15 and 12 per cent, respectively. The use of land (interest, taxes and rent) accounted for 17 per cent of the total cost of production per acre.

The high-cost group had a cost per acre of \$108.26, \$29.72 more than the low-cost group, and they obtained 4.4 bushels more corn per acre. Manure cost per acre was the most important factor contributing to the higher cost for the high-cost group, accounting for 30 per cent of the extra cost.

The net returns to risk and management averaged \$32.62 per acre for the 30 farms, \$19.27 for the high-cost group and \$42.81 for the low-cost group.

When the data were sorted on a net return per acre basis it showed that the high-net-return group had a cost per acre of \$17.53 less than the low-net-return

group and obtained 16 bushels more corn per acre (Table 4). The net returns to risk and management averaged \$55.10 for the high-net-return group as compared with \$14.65 for the low-net-return group.

OTHER DATA ON GRAIN CORN PRODUCTION

These 30 grain corn farms in Eastern Ontario had an average return per acre to risk and management of \$32.62. A similar survey carried out by the Ontario Department of Agriculture in Western Ontario showed an average return to risk and management of \$25.00 per acre (2). The average yield was 82.3 bushels in Eastern Ontario and 92.8 bushels in Western Ontario. The average cost per acre amounted to \$91.41 for Eastern Ontario and \$88.41 for the Western Ontario area while the average price received per bushel was \$1.51 and \$1.21, respectively. Technical experts on corn production suggest that yields per acre in Eastern Ontario are likely to be some 15 per cent lower than in Western Ontario. An important compensating factor is the lower price of land in Eastern Ontario.

Some farmers in Eastern Ontario have grown corn successfully over a period of 20 years. Their experience together with the results of experiments carried on by the Canada Department of Agriculture in Ottawa and by the Ontario Department of Agriculture at Kemptville, indicate that under good management, yields of about 100 bushels per acre can be expected with the use of recommended corn hybrids.

Grain corn production, therefore, could provide an attractive alternative source of income for many farmers in Eastern Ontario. Because of this an estimate was made of the potential acreage suitable for grain corn production in the seven counties. This estimate was made on the basis of crop adaptability ratings for each soil type which might be described as good, good to fair, and fair (3). There are close to a

million acres of land in these three classes, most of which are already under cultivation (Table 5). About 10,000 acres are seeded to grain corn.

Land classed as good and good to fair, about 64 per cent, has good potential as corn land, with some improvement in drainage. This would suggest a potential of about 600,000 acres which might be devoted to grain corn. Much of the land classed as fair, while considered as having some potential as corn land, has a greater problem with poor drainage.

The starch and distillery industries use about 8 million bushels of grain corn annually; this would require the production of approximately 100,000 acres. Most of this market is being supplied by the United States.

Grain corn producers in Eastern Ontario appear to have a price advantage over producers in Western Ontario. Year to year fluctuations and regional differences in corn prices in Ontario during the past 10 years are shown in Table 6. In all years average corn prices were higher in Eastern Ontario than in other parts of the province. Some of the reasons for this difference in price between Western Ontario and

Eastern Ontario are transportation costs and local market conditions.

Hauling grain corn from Chatham to Prescott by rail costs 23 cents a bushel. Handling, storage and markup at Prescott is about eight cents. In addition to these items, there is a transportation charge from Prescott to the feed dealers and other users. Transportation cost from Prescott to Ottawa is \$3 a ton or 8 cents per bushel, to Arnprior \$3.50 per ton and to Renfrew \$4 per ton. In total this accounts for about 40 cents a bushel.

There is some evidence that the corn price in Eastern Ontario follows closely that of United States corn at Prescott. For example, grain corn in store at Prescott in December 1967 and January 1968 was priced at \$54.29 a ton or \$1.51 a bushel. The estimated farm price for corn in Eastern Ontario at that time was also \$1.51 a bushel.

Another reason contributing to a higher average price for corn in Eastern Ontario is that a significant part of the corn production in that region is sold to farmers. There is a tendency for farmers to pay a slightly higher price for corn purchased from other

TABLE 5—POTENTIAL CORN AREA IN SEVEN COUNTIES IN EASTERN ONTARIO

Counties	Classification of Land for Corn Production			Total Potential Corn Land
	Good	Good to fair	Fair	
	thousand acres			
Carleton.....	4.5	138.2	23.1	165.8
Russell and Prescott.....	16.9	38.7	73.0	128.6
Grenville.....	33.5	34.4	39.2	107.1
Dundas.....	28.0	57.3	72.9	158.2
Stormont.....	67.1	48.8	41.5	157.4
Glengarry.....	114.1	32.5	101.6	248.2
Total.....	266.1	349.9	351.3	967.3

Source: Soil survey reports, for references see end of article.

TABLE 6—FARM VALUE OF GRAIN CORN IN ONTARIO BY REGION, 1957-1966

Year	Region				Province
	Southern Ontario	Western Ontario	Central Ontario	Eastern Ontario	
	dollars per bushel				
1957.....	1.06	1.16	1.17	1.29	1.18
1958.....	1.17	1.23	1.22	1.32	1.21
1959.....	1.03	1.13	1.10	1.14	1.10
1960.....	1.14	1.16	1.20	1.24	1.23
1961.....	1.14	1.16	1.24	1.30	1.21
1962.....	1.20	1.25	1.27	1.29	1.28
1963.....	1.37	1.40	1.40	1.41	1.37
1964.....	1.24	1.27	1.32	1.32	1.30
1965.....	1.29	1.31	1.34	1.45	1.30
1966.....	1.41	1.43	1.51	1.52	1.42
1967 ^a	1.29	1.29	n.a.	1.51	n.a.

^aEstimated.

Source: *Agricultural Statistics for Ontario, 1966*, Publication 20, Ontario Department of Agriculture and Food, Toronto.

farmers than from grain dealers. The reason for this may be that they buy a small quantity when needed and do not take into consideration the moisture content.

SUMMARY

1. Grain corn was produced with various degrees of success. Acreage, yield and production costs are a few of the factors affecting the success.
2. The average acreage of grain corn was 98.7 acres per farm.
3. The average yield was 82.3 bushels per acre.
4. The average cost of production was \$91.41 per acre.
5. The average net return to risk and management was \$32.62 per acre.
6. The average price received for dry shelled corn was \$1.51 per bushel.
7. About 36 per cent of the grain corn production was used on the farm for livestock feed. The remaining 64 per cent was sold, mainly to feed mills and to other farmers.
8. There are close to a million acres of potential corn land in the seven counties. Sixty-four per

cent of this amount is in the top two land productivity classes, of good and good to fair.

9. There is an estimated industrial market for grain corn of approximately 8 million bushels. If produced in this region it would require the production of about 100,000 acres.
10. There are about 10,000 acres of grain corn being grown annually in the seven counties.

ACKNOWLEDGEMENTS AND REFERENCES

- (1) The author acknowledges the contribution of F. Mooney and D. W. Sword, who did the interviewing. Mr. F. Mooney worked on the study until the analysis stage was completed. The author also wishes to thank the 30 grain corn producers who provided the primary information. The study was made possible only through their cooperation.
- (2) Feed Cost Study, 1967, Ontario Department of Agriculture and Food, Toronto, Ontario.
- (3) The following published material of the Ontario soil survey by the Canada Department of Agriculture, Ottawa and the Ontario Department of Agriculture, Toronto has been used in the preparation of the estimate on corn area potential:
 - Report No. 7 Soil Survey of Carleton County
 - Report No. 33 Russell and Prescott Counties
 - Report No. 12 Soil Survey of Grenville County
 - Report No. 14 Soil Survey of Dundas County
 - Report No. 20 Soil Survey of Stormont County
 - Report No. 24 Soil Survey of Glengarry County

MANUFACTURING MILK AND CREAM PRODUCTION IN CANADA (1)

W. J. White and V. A. Heighton

The structure of the Canadian manufacturing milk and cream industry has undergone significant change in recent years. There are many indications that further adjustments are inevitable. A survey was undertaken to obtain quantitative and qualitative measures of these changes and to determine the nature, direction and cause of those adjustments which have taken place and those which are still in process.

Specific information on various characteristics of the farm business, including physical resources, the nature and relative importance of the dairy enterprise, labor utilization and the use of modern dairy techniques, was obtained from a questionnaire sent to all dairy farmers registered with the Agricultural Stabilization Board and who did not sell milk to fluid processors for bottling, at the time of mailing in July 1966. Useful replies were received from 76,112 which represented 42.5 per cent of the registered farmers. The information was analyzed in terms of four characteristics namely, the number of cows milked, the share of total cash receipts received from the sale of milk and cream, the market to which milk and cream was sold, and the age of the farm operator.

DAIRY ENTERPRISE SITUATION

Size of Herd

The average number of cows milked was 11.8 per farm. Thirty-six per cent of the respondents milked seven cows or less. The proportion of herds smaller than the national average was much higher in the Maritimes and in Western Canada than in Ontario and Quebec. The figures for Prince Edward Island and Saskatchewan were 52 and 81 per cent and for Ontario and Quebec 24 and 17 per cent, respectively. The percentage of farmers milking more than 25 cows was very small, 2 per cent or less in 5 provinces, Prince Edward Island, Nova Scotia, New Brunswick, Manitoba and Saskatchewan. Only in Ontario, did more than 10 per cent of the farmers milk more than 25 cows.

The average number of cows milked per farm remained practically unchanged between 1964 and 1966, increasing from 11.6 to 11.8. The number per farm increased in Ontario, Quebec and Prince Edward Island, remained constant in Alberta and British Columbia, and decreased in the other provinces. The greatest change occurred in New Brunswick where the average number of cows milked decreased from 9.5 to 8.2 per farm.

Sales of Milk and Cream

The national annual average sale of milk was 100,187 pounds per farm. Average sales of milk per farm varied considerably from province to province. The Ontario average was substantially larger than that of all other provinces except British Columbia. Average sales of milk per farm in Nova Scotia, New Brunswick, Manitoba and Saskatchewan was only slightly more than half the national average. A large proportion of farms outside Ontario, Quebec and Alberta sold less than 20,000 pounds of milk per year. In Saskatchewan, 68 per cent of the farmers reporting had sales of less than 20,000 pounds, the amount of milk which can be produced by two superior dairy cows. In Ontario, by comparison, more than half the farms reported sales of more than 100,000 pounds per year.

The farmers between the ages of 31 and 45 years sold more milk and cream than those who were younger or older. Those 30 years of age and under had the next largest sales. The average amount of milk and cream sold decreased as the age of the operator increased for those more than 45 years of age.

Slightly more than half the farmers indicated that their milk went into the production of butter. About a third reported selling to a processing plant and 10 per cent to a cheese factory. Two thirds or more of the farmers in the Maritime and the Prairie Provinces sold to creameries or other plants where the milk was used to produce butter.

The average butterfat sales per farm, for those selling cream, were 1,492 pounds. Most cream shippers did not sell a large amount of cream. Approximately a quarter of all cream producers had sales of less than 500 pounds of butterfat during the year July 1, 1965 to June 30, 1966. One half of the cream shippers reported sales of less than 1,000 pounds of butterfat. Average sales were lowest in Saskatchewan, where over 70 per cent of all producers reporting sales of cream sold under 1,000 pounds of butterfat during 1965-66. Average sales per farm were 875 pounds. Sale of cream per farm was highest in Quebec where the average was 2,111 pounds of butterfat. Only Quebec, Ontario and Prince Edward Island had average sales larger than the national average of 1,492 pounds of butterfat per farm. Thirty-seven per cent of the respondents indicated that milk and cream sales contributed less than a quarter of their cash receipts. On the other hand, only 17 per cent indicated that milk and cream sales represented three quarter or more of their farm receipts. Ontario and Quebec farmers showed a heavy dependence on dairy income

while the farmers in the Prairie Provinces showed little.

The share of cash receipts from the sale of milk and cream increased as the number of cows milked increased. Fifty-five per cent of the farmers who received more than three quarters of their cash income from the sale of milk and cream milked 17 cows or fewer. The number of cows milked was dependent on the market available. Those who sold to processing plants milked an average of 14.6 cows per farm. This compared with an average of 17.0 cows per farm for farmers who sold to plants which made cheese and 9.2 cows for cream shippers. The older the farm operator, the smaller the average number of cows milked.

Only a third of Ontario farmers reported selling to creameries. The cheese plant was a very important market in Ontario, but not in the other provinces. In Ontario, 24 per cent of the farmers sold to this outlet. In the other provinces 8 per cent or less sold to cheese factories.

FARM CHARACTERISTICS

Value of Real Estate

The average market value of land and buildings reported by all respondents was \$21,500. The provinces were placed into three groups on the basis of average value of land and buildings. The average investment in land and buildings was less than \$16,000 in New Brunswick, Quebec and Nova Scotia. The intermediate group, consisting of Prince Edward Island, Ontario and Manitoba, had average investments of \$20,000 to \$26,000. The provinces in the highest group were British Columbia, Saskatchewan and Alberta, with averages of \$28,000 or more.

The difference in the level of investment in real estate between Ontario and Quebec was quite pronounced. In Quebec, 31 per cent of the producers had less than \$7,450 invested, compared with 14 per cent in Ontario. Only 6 per cent of Quebec farmers had \$24,950 or more invested compared with 30 per cent of the Ontario farmers. Those dairy farmers who milked more than 50 cows increased their acreages the most, while those milking 7 cows or less increased the least from 1964 to 1966.

Size of Farm

The average size of farm reported by all respondents was 262 acres. This average appears to be inflated by the large farms in the Prairie Provinces. There was great variation from province to province in the number of acres operated. Over a quarter of the farms in Nova Scotia were under 70 acres. By contrast, less than 2 per cent of the farms in Saskatchewan were this small.

The size of farm increased as the number of cows milked increased, except in Quebec, Saskatchewan and Alberta where this relationship was opposite. In Quebec, farmers who milked from 8 to 17 cows had slightly larger farms on the average than those who milked from 18 to 25 cows. In Saskatchewan and Alberta, the majority of farmers milked 7 cows or less and reported more acres than those who milked from 8 to 17 cows.

Between 1964 and 1966 the average number of acres operated changed from 236 to 262, an increase of 11 per cent. The largest change occurred in New Brunswick where the average changed from 128 acres to 174, an increase of 36 per cent. Manitoba and Ontario had the smallest percentage increases, 9 and 10 per cent respectively.

The farmers who received the smallest share of their income from dairy sales increased the size of their farms the most. Cream shippers increased the size of their average land holdings more than farmers who sold to manufacturing plants or cheese factories.

Land Use

More than half the land on dairy farms in the Prairie Provinces was in grains, cash crops or summerfallow. While the average acreage devoted to grain, cash crops or summerfallow was much larger in the Prairies than in the rest of Canada, there was little difference in the number of acres in hay and pasture. The average number of acres in hay and pasture increased as the number of cows milked increased. The average number of acres in crops was higher for those farmers milking from 8 to 50 cows than for those milking either fewer or more cows.

LIVESTOCK ON FARMS

Cattle

The average number of cows, including cows kept for both dairy and beef purposes was 17 per farm. Over a fifth of all farmers reported keeping 7 cows or less and 63 per cent had 17 cows or less on their farms. In Ontario and Quebec, the two most important dairy provinces, almost a sixth of the herds consisted of seven or fewer cows. In Nova Scotia almost two thirds of the herds were this small.

The average number of cows per farm increased as the share of income received from dairy sales increased in all provinces except Manitoba, Saskatchewan and Alberta. In these three provinces less than half of the cows reported were being milked. The farmers who sold cream, except in the provinces of Manitoba and Saskatchewan, had smaller numbers of cows per farm than those who sold milk to a manufacturing plant or cheese factory.

TABLE 1—AVERAGE NUMBERS OF LIVESTOCK ON FARMS SELLING MANUFACTURING MILK OR CREAM, CANADA AND PROVINCES, 1966

	Average Number per Farm ^a				
	Cows all Types	Cows Milking	Steers and Heifers	Calves	Hogs
	number				
Canada.....	17	12	10	9	28
Prince Edward Island.....	10	8	9	9	21
Nova Scotia.....	8	6	6	6	15
New Brunswick.....	10	8	6	7	11
Quebec.....	17	15	9	6	26
Ontario.....	18	15	12	10	37
Manitoba.....	14	7	8	10	22
Saskatchewan.....	15	5	8	12	16
Alberta.....	21	8	13	17	27
British Columbia.....	12	8	6	7	12

^aAll averages are based on those farms reporting at least one head of the various type of livestock.

The average number of steers and heifers kept was fairly small, 10 per farm (Table 1). In every province except Ontario, 55 per cent or more of the farmers reported 7 steers or less. The number of steers and heifers kept increased as the number of cows milked increased in every province except British Columbia where the average number per farm was the same for all those who milked less than 50 cows.

Fifty-three per cent of the manufacturing milk and cream producers reported they had no registered cows. Sixty-five per cent of the farmers who reported registered cows had less than 8 cows registered, 21 per cent had from 8 to 17 and 8 per cent had from 18 to 26. Farmers in Ontario had the largest average number of cows registered, 11 per farm, while those in Nova Scotia had the smallest number at 4 per farm. The overall average was 8.4 registered cows per herd, for those having at least one registered cow in their herd.

About half the farmers were using beef bulls as a means of improving the quality of their calves as stockers. Of those who had used a beef sire during the previous year, slightly over half, 54 per cent, had bred 7 or less cows in this manner. Thirty-five per cent of the users had bred from 8 to 17 cows. The overall average on farms using a beef bull was nine cows. Provincially, the number of milk cows bred to a beef bull varied from a high of 10 in Ontario, Quebec and Manitoba to a low of 5 in Nova Scotia and British Columbia.

Hogs

More than half of the farmers in the survey, 56 per cent, reported raising hogs. Thirty-nine per cent of those reporting hogs, milked 7 cows or fewer. On a provincial basis, Nova Scotia, New Brunswick and British Columbia had the highest percentage of re-

spondents reporting hogs with 74, 67 and 69 per cent respectively. The farmers in these provinces reported the smallest average number of hogs per farm. By comparison, the farmers in Quebec, Ontario and Alberta kept the largest number of hogs per farm averaging 26, 37 and 27 respectively.

The number of hogs kept was influenced by the number of cows milked, share of income from the dairy enterprise, market outlet and age of the operator. As the dairy herd size increased, the average number of hogs kept also increased. Those farmers receiving less than a quarter of their cash receipts from dairy sales kept an average of 32 hogs, compared with 21 for those who received more than three quarters of their income from dairy sales. The average number of hogs kept increased as the share of income from dairy increased on those farms reporting hogs but the percentage of farmers reporting hogs decreased. The number of hogs, a dairy farmer reported, depended to some extent on where he sold his milk or cream. The farmers who sold to processing plants reported an average of 34 hogs, the cheese producers 29, and the the cream producers 25 per farm. Younger farmers were more likely to have hogs than older farmers, and to have larger numbers of hogs.

LABOR CHARACTERISTICS

Family Help

No distinction was made between paid and unpaid family help. About a quarter of the respondents indicated that they had no family help with the dairy herd, about a third had one helper at both milkings and slightly less than a quarter had two helpers at each milking. The average number of helpers available in the morning was the same as in the evening, 1.4 persons per farm. A slightly larger percentage reported having no help in the morning than reported

no help in the evening. The figures were 28 and 26 per cent respectively. A slightly larger number of farmers indicated that they received help from more than two family members in the evening than in the morning. A comparison between Ontario and Quebec indicated that Quebec dairy farmers were less likely to have no help, less likely to have only one helper and very much more likely to have three or more helpers than Ontario dairy farmers.

The number of family helpers increased as the number of cows milked increased. This was true for all provinces and suggests that the number of cows milked may be influenced by the amount of family help available. The number of family helpers was not related to the share of income derived from dairy sales or the type of plant which purchased the milk. The farmers from 46 to 55 years of age had more family helpers than those who were either younger or older.

Hired Help

Approximately half of the farmers reported hiring help during the previous year. There was large variation from province to province in the amount of labor hired. Seventy-three per cent of the respondents from Prince Edward Island indicated they hired help. In the Prairie Provinces and British Columbia only about 40 per cent of the farmers reported hiring help. In all provinces, except Prince Edward Island, few farmers reported hiring more than 65 days of help. About a quarter of the farmers in each province, except Prince Edward Island, employed outside assistance for from 1 to 28 days. Less than 1 per cent of the respondents reported more than 365 days of hired labor. The average amount of paid labor, calculated for all respondents, was 36 days. For those farmers who hired labor, the average was approximately twice this large since 53 per cent did not report hiring any help. In both Ontario and Quebec exactly half the farmers had some hired help and the average time for which help was hired was 39 days.

As might be expected, the number of days of paid labor was directly related to the number of cows milked. The average number of days increased from 27 for those farmers with from 1 to 7 cows milking to 240 for those with from 51 to 100 cows milking. The share of income derived from dairy sales had little effect upon the amount of labor hired. The type of plant to which the farmer sold his milk slightly influenced the amount of labor hired. A smaller percentage of the farmers who shipped cream reported hiring help than did farmers who sold their milk to either cheese factories or processing plants. The farmers between the ages of 46 and 55 years were more likely to hire help than those who were either younger or older.

Off-Farm Work

The majority of farmers in every province reported that they had not worked off their farm during the previous year. In Saskatchewan only 13 per cent reported any off-farm work. By comparison 45 per cent of the farmers from Nova Scotia indicated some off-farm employment (Table 2).

TABLE 2—OFF-FARM EMPLOYMENT REPORTED BY FARMERS SELLING MANUFACTURED MILK OR CREAM, CANADA AND PROVINCES, 1966

	Percentage Reporting No Off-Farm Work	Average Number of Days Worked, All Respondents	Average Number of Days Worked By Those With Jobs
	per cent	days	days
Canada.....	69	32	106
P.E.I.....	74	29	81
N.S.....	55	58	128
N.B.....	60	51	127
Que.....	56	40	92
Ont.....	75	34	132
Man.....	84	17	109
Sask.....	87	11	88
Alta.....	80	23	119
B.C.....	60	72	181

The average number of days worked, based on all the respondents, reached a high of 72 days in British Columbia and a low of 11 in Saskatchewan. The national average was 32 days. The average number of days worked by those reporting off-farm work was 106.

The number of cows milked influenced the amount of time worked off the farm. The average number of days worked off the farm, for all provinces, was 38 for those who milked 7 cows or less, 33 days for those with from 8 to 17 cows, 23 days for those milking from 18 to 25 cows, 15 days for those milking from 26 to 50 and 11 days for farmers milking more than 50 cows.

The percentage of farmers who had off-farm jobs decreased as the age of the operator increased. In every province the older the farm operator, the less likely he was to have an off-farm job. Farmers between 31 and 55 years of age, who had jobs, tended to work more days than those who were either younger or older.

Age of Operator

The average age of the manufacturing milk and cream producers was 48 years. There was little variation among provinces except for Nova Scotia where the average age was 55 years. Fifty-three per cent of all Nova Scotia farmers were 55 years of age or more. By comparison, only 28 per cent of the Quebec farmers were this old. For the other provinces the average age ranged from 47 to 51 years.

TABLE 3—PERCENTAGE OF FARMS SELLING MANUFACTURING MILK OR CREAM USING MODERN PRACTICES, CANADA AND PROVINCES, 1966

	R.O.P. or D.H.I.A.	Artificial Insemination	Milking Machine	Pipeline Milker	Bulk Tank	Can Cooler
Canada.....	6	36	54	3	8	29
Prince Edward Island.....	14	72	42	5	1	20
Nova Scotia.....	4	52	30	1	^a	12
New Brunswick.....	7	41	51	5	2	15
Quebec.....	7	24	63	2	13	40
Ontario.....	7	59	74	5	12	34
Manitoba.....	4	35	21	1	^a	13
Saskatchewan.....	4	26	14	^a	^a	6
Alberta.....	4	35	41	2	2	15
British Columbia.....	7	64	47	4	10	28

^aLess than one per cent.

The age of the farm operator was an important factor in determining herd size and the share of income which came from the sale of milk and cream, but had little influence on the market to which the milk was sold.

THE ADOPTION OF MODERN DAIRY PRACTICES

Modern dairy practices were being used by a minority of Canadian dairy farmers who sold manufacturing milk or cream. The level of adoption of each of six modern dairy practices is shown in Table 3. Only 6 per cent of the farmers were utilizing R.O.P. or D.H.I.A. testing programs. Twice as many farmers in Prince Edward Island, as anywhere else in Canada, were using either R.O.P. or D.H.I.A. Even there, only one dairy farmer in seven was utilizing either of these programs. The proportion of farmers keeping production records was only 1 in 25 in Nova Scotia, Manitoba, Saskatchewan and Alberta.

Slightly over a third of all Canadian dairy farmers reported that they used artificial insemination. In Prince Edward Island almost three-quarters of all farmers reported using artificial insemination. By contrast, only a quarter were using this breeding technique in Quebec and Saskatchewan, and about a third had adopted it in Manitoba and Alberta. Slightly over half of all farmers indicated they used a milking machine. In Saskatchewan, the proportion was only one out of seven, while in Ontario, it was three out of four farmers. Only 3 per cent of Canadian manufacturing milk and cream producers were using a pipeline milking system. In three provinces, Prince Edward Island, New Brunswick, and Ontario, 5 per cent of the farmers had adopted this system. In Nova Scotia, Manitoba and Saskatchewan, 1 per cent or less of the farmers reported using pipelines. The adoption of bulk tanks was quite low. They had been purchased by about a tenth of the farmers in British Columbia and an eighth of those in Ontario and Quebec. In all

the other provinces no more than 2 per cent of the farmers had bulk tanks. Can coolers were reported by 40 per cent of the farmers in Quebec, 34 per cent of those in Ontario and by 28 per cent of those in British Columbia. Saskatchewan farmers indicated that can coolers were being used by only 6 per cent of those selling manufacturing milk or cream.

The adoption of all six of the practices was positively related to the number of cows milking, share of income from dairy, the market to which milk was sold, and the value of land and buildings. Younger men were more likely to adopt modern dairy practices than older men. The only exception was a pipeline milker.

CONCLUSIONS

1. The majority of Canadian manufacturing milk and cream producers operated mixed farms. Most of these farmers received less than half of their income from the sale of milk and cream. Only 17 per cent of the manufacturing milk and cream producers, received more than three quarters of their income from dairy sales. The production of dairy products was a major enterprise on the farms of a minority of the manufacturing milk and cream producers.
2. The majority of manufacturing milk and cream producers milked a small number of low producing cows. The average number of cows milked was 11.8 per farm. Average sales per farm were 100,187 and 1,492 pounds of milk and cream respectively. An equivalent amount of manufacturing milk and cream could have been produced by a substantially smaller number of farmers if the average number of cows milked per farm had been larger and the production per cow higher.
3. The average size of farms operated by manufacturing milk and cream producers changed from 236 to 262 acres between 1964 and 1966.

This represented an increase of 11 per cent. The average number of cows milked per farm increased only 1.7 per cent during the same period. Although there were major differences between provinces, this suggests that the dairy enterprise is becoming less important in relation to other livestock and crop enterprises on many dairy farms.

4. Four out of five manufacturing milk and cream producers did not have employment off their farms. Dairy farmers probably were less likely to hold a part-time job, than most other farmers, because of the amount and the nature of labor required to manage a dairy herd. Those who held an off-farm job reported working an average of 106 days per year. There was wide variation from province to province in the percentage of farmers who held off-farm jobs and the average number of days worked.
5. The average age of manufacturing milk and cream producers was 48 years. The farmers between 31 and 45 years of age had larger farms, milked more cows, and were more likely

to sell to a processing plant or a cheese factory than farmers who were either younger or older. Only 1 dairy farmer in 7 was under 35 years of age while 1 in 3 was 55 years of age or more. Because of this age distribution, a large number of dairy farmers can be expected to leave the industry in the next few years.

6. The level of adoption of modern dairy practices was low, particularly for those farmers in Saskatchewan, Manitoba and Nova Scotia. Nationally, less than a third of all the farmers reported using a milking machine and either a can cooler or a bulk tank. A minority of manufacturing milk and cream producers were utilizing modern labor saving machinery and up-to-date management practices such as production recording and artificial insemination.

REFERENCES

- (1) For further details see *The Structure of the Manufacturing Milk and Cream Industry in Canada* by W. J. White and V. A. Heighton, Economics Branch, Canada Department of Agriculture, Ottawa, 1968, Publication No. 68/6.

OTHER SOURCES OF INCOME ON CREAM AND MANUFACTURING MILK PRODUCING FARMS IN CANADA

W. Y. Yang

The following is a brief discussion of enterprise combinations, and the importance of supplementary sources of income on manufacturing milk and cream producing farms registered with the Agricultural Stabilization Board. Methods of sampling and procedures of data collection have been presented in a recent report issued by the Economics Branch, Canada Department of Agriculture (1).

Small herds are predominant on non-fluid milk dairy farms throughout Canada. Over 90 per cent of 28,159 cream-shipping farms had fewer than 18 cows, and 65 per cent of 22,923 farmers shipping manufacturing milk reported fewer than 18 cows. For most of these farms, income from sources other than dairy herds was of great importance. In the Prairie Provinces it has been traditional for farmers to keep a few cows to utilize pasture and to supplement income from grains. In other provinces, steer, hog, sheep, fruit or vegetable enterprises are often combined with dairying, and are important sources of income for the cream and manufacturing milk shipping farmer.

More than three-quarters of the cream-shipping farmers reported cream sales totaling less than half of their total cash receipts, and more than 50 per cent of the farmers shipping manufacturing milk reported milk sales totaling less than half their total cash receipts.

In Saskatchewan, Alberta and Manitoba only 7 per cent, 11 per cent and 15 per cent respectively, of cream shippers, had cream sales totaling more than 50 per cent of their total cash receipts. In British Columbia there were 22 per cent and in Ontario only 17 per cent. Generally, the proportions were similar for producers of manufacturing milk.

About 80 per cent of the manufacturing milk and cream producing farmers registered with the Canadian Dairy Commission had fewer than 18 cows. Based on production estimates, it has been assumed that farmers with fewer than 18 cows would have an annual milk production of less than 100,000 pounds, while farmers with fewer than 8 cows would have annual production totaling less than 50,000 pounds. The data which follows refers to these two groups of farms, that is, those with 1 to 7 cows, and those with 8 to 17 cows.

Steers

Over 80 per cent of the farmers, in all provinces, selling either cream or manufacturing milk, reported having steers. The number of steers kept per farm varied directly with the size of the cow herd, and

inversely with the share of cream and milk sales in total cash receipts. Alberta and Ontario farmers had the greatest numbers of steers per farm.

Hogs

More than three-quarters of the farmers shipping cream reported keeping hogs. There were proportionately more farmers keeping hogs in the larger herd groups than in the smaller herd groups. Alberta, Saskatchewan, Manitoba and Ontario had the highest percentage of cream shippers keeping hogs.

In comparison with the cream shippers, proportionately fewer milk shipping farms kept hogs, in all provinces. The Prairie Provinces had the highest percentage of milk shippers keeping hogs, followed by New Brunswick, Prince Edward Island and Ontario.

The type of dairy enterprise did not appear to influence the number of hogs kept. Ontario and Alberta farmers kept more hogs per farm than did farmers in other provinces. Farmers with 8 to 17 cows kept more hogs than farmers with 1 to 7 cows.

Sheep

Some dairy farmers reported having sheep, most commonly in Nova Scotia, Prince Edward Island and Ontario. Generally, more farmers in the smaller herd group kept sheep, and they also kept more sheep per farm.

Cash Crops

Most dairy farmers reported some land planted to cash crops, particularly those with a small number of cows and whose income from dairy sales amounted to a small part of total cash receipts. For those farmers keeping 1 to 7 cows the average acreage of cash crops was largest on those farms where dairy sales were the smallest proportion of total cash receipts.

Off-Farm Work

More than one in four of the operators of cream-shipping farms and more than one in three of the milk shippers reported off-farm work during the year from July 1965 to June 1966. Quebec, Nova Scotia and New Brunswick led other provinces in the proportion of farmers who worked away from their farms. In these provinces, more than half of the operators had off-farm employment during the year. In British Columbia about 40 per cent of the farmers had off-farm jobs, and in Ontario about 30 per cent. A comparatively small proportion of the farmers in the

Prairie Provinces had off-farm work. Generally, farmers with the smallest herds reported the most days of off-farm work. Farmers shipping cream usually had fewer days of off-farm work than farmers shipping milk.

REFERENCES

- (1) W. J. White and V. A. Heighton, *The Structure of the Canadian Manufacturing Milk and Cream Industry*, Economics Branch, Canada Department of Agriculture, Ottawa, Pub. 68/6, 1968.

TABLE 1—PERCENTAGE OF MANUFACTURING MILK AND CREAM PRODUCING FARMS REPORTING STEERS, HOGS, SHEEP AND OFF-FARM WORK, CANADA, 1965-66

Number of milk cows per farm	1 to 7 cows			8 to 17 cows		
	less than a quarter	quarter to half	more than half	less than a quarter	quarter to half	more than half
Share of dairy sales in total cash receipts						
per cent						
Cream Producers:						
Steers.....	88.2	87.4	84.8	94.3	93.6	91.4
Hogs.....	77.2	76.1	69.0	88.0	85.4	78.9
Sheep.....	8.5	11.3	9.7	10.6	11.6	12.0
Off-farm work.....	23.3	29.2	31.9	22.6	31.4	38.9
Manufacturing Milk Producers:						
Steers.....	86.0	84.2	80.6	93.1	93.9	91.9
Hogs.....	72.6	60.8	50.2	76.8	71.4	56.7
Sheep.....	8.3	11.5	6.1	7.6	9.4	7.4
Off-farm work.....	27.2	37.0	31.6	33.6	38.5	35.0

TABLE 2—AVERAGE NUMBER OF DAYS OF OFF-FARM WORK BY OPERATORS OF MANUFACTURING MILK AND CREAM PRODUCING FARMS, AND THE AVERAGE NUMBER OF ANIMALS RAISED ON THOSE FARMS REPORTING STEERS, HOGS AND SHEEP, CANADA, 1965-66

Number of milk cows per farm	1 to 7 cows			8 to 17 cows		
	less than a quarter	quarter to half	more than half	less than a quarter	quarter to half	more than half
Share of dairy sales in total cash receipts						
number						
Cream Producers:						
Steers.....	9.6	5.8	4.7	12.7	9.5	7.8
Hogs.....	24.1	13.5	9.7	39.0	25.0	16.9
Sheep.....	44.1	26.2	16.5	32.9	27.5	20.7
Days off-farm work.....	29.0	30.0	36.0	23.0	28.0	30.0
Manufacturing Milk Producers:						
Steers.....	8.6	5.9	5.6	14.4	9.8	7.7
Hogs.....	23.7	21.0	18.2	40.9	34.5	20.7
Sheep.....	43.2	36.5	13.1	26.6	30.3	18.0
Days off-farm work.....	40.0	46.0	40.0	41.0	45.0	31.0

STRUCTURAL CHANGES IN THE CATTLE ENTERPRISES OF PRAIRIE PROVINCE FARMS

W. J. Lockhart

The Canadian Prairie Provinces are important producers of cattle. The 1966 Census of Canada showed that the provinces of Alberta, Saskatchewan, and Manitoba accounted for 54 per cent of all Canadian cattle, a 7 per cent increase in their share since 1956. Associated with the increased cattle inventory were a number of other important changes.

The objective of this paper is to outline some of the changes that have occurred in the cattle industry in the Prairie Provinces during the 1956-66 period. Changes discussed include cattle numbers on census farms, principal purpose for which cattle are kept, average herd sizes, and distribution of farms by herd sizes. Changes are also discussed by provinces and by regions. The regions chosen are the prairie region, having a semi-arid climate, and the parkland region, having a more humid climate (1). Mixed farming is commonly carried out in the parkland regions of the three provinces. While a small number of dairy cattle are maintained on many farms in these areas the larger dairy herds tend to be concentrated around the more densely populated areas such as Winnipeg, Edmonton and Calgary (2). Wheat farming and cattle ranching are more typical of the prairie regions. Within the prairie region of Alberta also lie the major irrigation districts.

CATTLE NUMBERS

During the 1956-66 period cattle numbers in Canada increased by 1,869,000 to 12,888,000 head. Ninety-six per cent of the total Canadian increase occurred in

the Prairie Provinces where the number of cattle increased by 1,800,000 to 6,989,000 head. The increases by provinces were 40, 28, and 32 per cent respectively in Alberta, Saskatchewan and Manitoba. Ontario was the only other province to experience an increase (8 per cent) in cattle inventory during the 1956-66 period.

On a regional basis the parkland region of Alberta experienced the largest percentage increase in cattle numbers, 52 per cent (Table 1). During the same period the other areas of the Prairie Provinces reported smaller percentage increases in cattle numbers, 26 to 32 per cent. The 35 per cent increase in cattle numbers for the Prairie Provinces as a whole during the period was approximately double the Canadian increase of 17 per cent.

SHIFT IN PRODUCTION FROM MILK TO BEEF

The general pattern that has developed since the end of World War II is a reduction in the number of cows kept for milk production and an increase in the number of cows kept for beef production. During the 1956-66 period, Canada experienced a 15 per cent decrease in the number of cows being kept for milk production (Table 2). In the Prairie Provinces cows kept for milk production declined almost 30 per cent with the largest reduction occurring in the prairie and parkland regions of Saskatchewan (48 and 42 per cent). The smallest decrease, 11 per cent, occurred in the parkland region of Alberta. In all regions declines

TABLE 1—CATTLE NUMBERS AND CHANGES IN CATTLE NUMBERS, CANADA AND THE REGIONAL AREAS OF THE PRAIRIE PROVINCES, JUNE 1, 1956, 1961, AND 1966

	Number of Cattle			Change in Number of Cattle	
	1956	1961	1966	1961-66	1956-66
	thousands			per cent	
ALBERTA					
Parkland Region.....	1,305	1,555	1,978	+27	+52
Prairie Region.....	1,145	1,325	1,462	+10	+28
SASKATCHEWAN					
Parkland Region.....	898	1,022	1,177	+15	+31
Prairie Region.....	971	1,099	1,221	+11	+26
MANITOBA					
Parkland Region.....	871	996	1,151	+16	+32
PRAIRIE PROVINCES.....	5,190	5,997	6,989	+17	+35
CANADA.....	11,019	11,941	12,888	+ 8	+17

Source: *Census of Agriculture, Alberta, Saskatchewan, Manitoba, 1956, 1961, and 1966.*

TABLE 2—COWS AND HEIFERS, TWO YEARS AND OVER, KEPT FOR MILK PRODUCTION AND BEEF PRODUCTION, CANADA AND THE REGIONAL AREAS OF THE PRAIRIE PROVINCES, JUNE 1, 1956, 1961, AND 1966

	For Milk Production					For Beef Production				
	Number			Change in Number		Number			Change in Number	
	1956	1961	1966	1961-66	1956-66	1956	1961	1966	1961-66	1956-66
	thousands			per cent		thousands			per cent	
ALBERTA										
Parkland Region.....	226	232	200	-14	-11	329	406	588	+45	+79
Prairie Region.....	56	56	43	-23	-23	405	484	530	+10	+31
SASKATCHEWAN										
Parkland Region.....	188	168	110	-35	-42	196	270	397	+47	+103
Prairie Region.....	84	73	44	-40	-48	318	400	482	+20	+52
MANITOBA										
Parkland Region.....	223	196	150	-23	-33	170	236	348	+47	+105
PRAIRIE PROVINCES...	777	725	547	-25	-30	1,418	1,796	2,345	+31	+65
CANADA.....	3,164	2,990	2,677	-10	-15	1,889	2,342	2,988	+28	+58

Source: *Census of Agriculture*, Alberta, Saskatchewan, Manitoba, 1956, 1961, and 1966.

in the number of cows kept for milk production were considerably larger in the 1961-66 period than in the 1956-61 period.

The number of cows and heifers, two years and over, kept for beef production increased substantially in all regions during the 1956-66 period. The largest increase occurred in the parkland region of Saskatchewan and Manitoba where beef cow numbers doubled. During the same period the parkland region of Alberta and the prairie region of Saskatchewan had increases in beef cow numbers of 79 and 52 per cent respectively. A 31 per cent increase in beef cows occurred in the prairie region of Alberta.

The shift from milk production to beef production could have occurred either by the producers disposing of their dairy cattle and replacing them with beef cattle or by shifting their production to beef only and eliminating the production of milk and cream for home consumption and sale. The large reduction in the number of cows reported kept for milk purposes and the increase in cows kept for beef purposes suggests that many farmers did not change their breeding stock but simply shifted their production pattern.

FARMS REPORTING CATTLE AND AVERAGE HERD SIZES

During the 1956-66 period there was a 16 per cent decrease in the total number of farms in the Prairie Provinces. During the same period there was a 23 per cent decrease in farms reporting cattle. The rate of decrease in farms reporting cattle was approximately 50 per cent more rapid than the decrease in the total number of farms. In the Prairie Provinces the percentage of all farms reporting cattle decreased from 77 per cent in 1956 to 70 per cent in 1966 (Table 3).

This decrease means that there were 4,300 more farms without cattle in 1966 than in 1956. Regionally in the Alberta parkland region there was a decrease from 80 to 76 per cent in this period and in the Alberta prairie region a decrease from 80 to 78 per cent. Much larger decreases in the percentage of farms with cattle occurred in the parkland regions of Saskatchewan and Manitoba and in the prairie region of Saskatchewan.

Larger cattle inventories and a declining proportion of the farms reporting cattle resulted in a general increase in average herd sizes. For all farms reporting cattle in the Prairie Provinces the average herd size increased from 29 head in 1956 to 51 head in 1966 (Table 3). Regionally the size of the herds in the parkland region of Saskatchewan and Manitoba doubled, from approximately 20 head in 1956 to 40 head in 1966. In the parkland region of Alberta the average herd was 30 head in 1956 and 50 head in 1966, a 66 per cent increase. The prairie region of Alberta with the largest number of cattle per herd experienced the smallest percentage increase (50 per cent) in average herd size, 63 head in 1956 to 95 head in 1966.

However, the information on the average size of cattle herds of all farms is misleading, because the data includes all farms reporting cattle irrespective of number. Small herds normally contribute little to farm income. Calculating the average herd size when farms with 1 to 17 head are excluded, gives a more realistic picture of the cattle enterprise (3). The average herd on farms in the Prairie Provinces, with 18 head or more increased from 49 head in 1956 to 68 head in 1966. In 1956, 51 per cent of the farms with cattle reported having herds of 18 head or more and accounted for 85 per cent of the cattle. By 1966, 72 per

cent of the farms with cattle reported having herds of 18 head or more and accounted for 95 per cent of the cattle.

Regionally, the average herd size on farms reporting 18 head or more, in the prairie region of Alberta increased by 28 head from 1956 to 1966. The increases

in the other regions were smaller in number, 15 to 19 head according to region, but represent proportionally greater increases over the 1956 herd than that which occurred in the Alberta prairie region. In all regions the increase in average herd size was greater in the 1961-66 period than in the 1956-61 period.

TABLE 3—PER CENT OF FARMS REPORTING CATTLE AND AVERAGE HERD SIZE FOR THOSE FARMS REPORTING CATTLE, FOR THE REGIONAL AREAS OF THE PRAIRIE PROVINCES, JUNE 1, 1956, 1961, AND 1966

	Farms Reporting Cattle			Cattle Per Farm for Farms Reporting Cattle			Cattle Per Farm for Farms Reporting 18 or More Head		
	1956	1961	1966	1956	1961	1966	1956	1961	1966
	per cent			number			number		
ALBERTA									
Parkland Region.....	80	79	76	29	38	53	50	55	69
Prairie Region.....	80	80	78	63	78	95	85	96	113
SASKATCHEWAN									
Parkland Region.....	78	74	68	21	27	38	36	42	51
Prairie Region.....	66	64	59	31	39	52	50	56	67
MANITOBA									
Parkland Region.....	79	77	71	22	30	41	37	44	56
PRAIRIE PROVINCES.....	77	74	70	29	38	51	49	56	68

Source: *Census of Agriculture*, Alberta, Saskatchewan, Manitoba, 1956, 1961, and 1966.

TABLE 4—TOTAL FARM NUMBERS AND PER CENT DISTRIBUTION OF FARMS BY SIZE OF CATTLE HERDS, FOR THE REGIONAL AREAS OF THE PRAIRIE PROVINCES, JUNE 1, 1956, 1961, AND 1966

	Total Farms	Farms Reporting					Total
		No Cattle	1 to 17 Head	18 to 62 Head	63 to 177 Head	Over 177 Head	
	numbers						
ALBERTA							
Parkland Region							
1956.....	56,529	20	39	34	6	1	100
1961.....	52,008	21	29	39	10	1	100
1966.....	49,716	24	20	36	17	3	100
Prairie Region							
1956.....	22,895	20	23	34	18	5	100
1961.....	21,204	20	17	33	23	7	100
1966.....	19,695	22	13	29	26	10	100
SASKATCHEWAN							
Parkland Region							
1956.....	55,657	22	44	31	3	a	100
1961.....	50,101	26	33	36	5	a	100
1966.....	45,921	32	22	35	10	1	100
Prairie Region							
1956.....	47,734	34	30	30	5	1	100
1961.....	43,823	36	23	32	8	1	100
1966.....	39,765	41	15	30	12	2	100
MANITOBA							
Parkland Region							
1956.....	49,201	21	41	35	3	a	100
1961.....	43,306	23	31	39	7	a	100
1966.....	39,747	29	23	36	11	1	100
PRAIRIE PROVINCES							
1956.....	232,016	23	37	33	6	1	100
1961.....	210,442	26	28	37	9	1	100
1966.....	194,844	30	20	34	14	2	100

aLess than 0.5 per cent.

Source: *Census of Agriculture*, Alberta, Saskatchewan, Manitoba, 1956, 1961, and 1966.

DISTRIBUTION OF FARMS BY HERD SIZE

The number of farms in the Prairie Provinces without cattle increased 7 per cent from 54,500 in 1956 to 58,800 in 1966. Among the regions, the percentage of all farms without cattle increased from 22 per cent to 32 per cent in the Saskatchewan parkland and from 21 per cent to 29 per cent in Manitoba. The change in Alberta was much smaller. For the Prairie Provinces the number of farms with 1 to 17 head of cattle decreased from 86,600, 37 per cent of all farms, in 1956 to 38,100, 20 per cent of all farms in 1966, a 56 per cent decrease. Generally in each of the regions there was approximately a 50 per cent decrease in the percentage of farms with 1 to 17 head (Table 4).

The percentage of farms reporting 18 to 62 head generally increased in the 1956-61 period and then decreased in the 1961-66 period. In each region approximately one-third of the farms reported 18 to 62 head with the parkland regions reporting slightly higher percentages than the prairie regions. The percentage of farms with more than 63 head increased throughout the 1956-66 period in all regions. In 1966 farms with over 177 head made up slightly over 2 per cent (4,900 farms) of all farms in the Prairie Provinces. Of these, 40 per cent were located in the prairie region of Alberta, of which the majority presumably were ranches.

OBSERVATIONS

This paper outlines some of the changes that occurred in the 1956-66 period in the structure of the cattle industry on farms in the Prairie Provinces. Briefly, the adjustments were decreases in total farm numbers and the number of farms reporting cattle, increases in total cattle numbers and average farm herd sizes, and a shift in production from milk to beef for a proportion of the cows. A more detailed study than is possible from a review of census data is required to state and support reasons for, and the implications of, changes in the structure of the cattle enterprises. No single factor or combination of factors will affect all regions or individual farm units identically.

Probably the major reason for a decrease in farms reporting cattle was the decision by the farmer that his income from a small herd did not yield a satisfactory return for his labor and capital. Alternative returns from use of pasture and labor released by the cattle enterprise were greater in cash grain production (4). The farmers may also have had the alternative of non-farm employment that would earn more income than that provided by the cattle herd. In addition the farmers and their families may have placed a high value on leisure time obtained through the disposal of the cattle. On many farms the children and wives have in the past, provided a substantial proportion of the labor to care for the cattle, including milking the

cows. With an increasing number of farm children going to school in urban centres they are no longer available for livestock chores. On farms where the grain enterprise is dominant there is considerable competition between it and the less important livestock enterprise at certain critical times of the year. The competition for available labor becomes more acute as the size of the grain enterprise becomes larger and requires more specialized operations such as weed spraying, that must be performed within a limited number of days.

The enlargement of farms that included additional grazing land, has made possible an increase in size of cattle herds. Herds have also increased as the number of patrons making use of community pastures decreased permitting individual allotments to increase. The possibility of raising farm income by achieving economies of scale with larger herds also acts as an incentive to increase herd sizes. Extension programs directed to increasing the size of cattle herds may also have had some influence.

The implications of the changes in structure are difficult to trace and identify. As more farmers decrease their cattle herds the first effect will be to release pasture and hay land for alternative uses. Land use does not change if rented pasture land or community pastures used by farmers previous to the disposal of their cattle herds is utilized by other farmers who increase the size of their herds. Some of the privately owned pasture land may go into cereal crop production which may or may not be desirable depending on the quality of the land.

Increasing herds means generally larger but fewer farms resulting in a continuing social and economic adjustment in both the rural and surrounding urban communities. In some areas these adjustments have occurred much more quickly than in other areas where the adjustments have yet to occur. The continuing elimination of cattle herds on some farms has a similar effect, particularly if it is accompanied by the farm family moving to an urban centre.

These and other changes that have occurred, and will continue to occur, in the farm structure of the cattle industry have important effects on the efficiency of farm resource use, on the rural communities, and the cattle industry. The full extent of, and trends of the changes, and implications thereof merit continuing and comprehensive study.

NOTES AND REFERENCES

- (1) Alberta and Saskatchewan were divided into Prairie and Parkland Regions. The Prairie Region approximates the Brown and Dark Brown Soil Zones. The Parkland Region includes the Black, Grey Wooded and the remaining areas. Manitoba was considered to be all Parkland. Delineation

of the regions was on the basis of 1966 Census Division boundaries, as follows:

Alberta Prairie Region includes Census Divisions 1, 2, 3, 4, 5 and 7,

Alberta Parkland Region includes Census Divisions 6, 8, 9, 10, 11, 12, 13, 14 and 15,

Saskatchewan Prairie Region includes Census Divisions 2, 3, 4, 6, 7, 8, 11, 12 and 13,

Saskatchewan Parkland Region includes Census Divisions 1, 5, 9, 10, 14, 15, 16, 17 and 18,

Manitoba Parkland Region includes all Census Divisions in Manitoba.

- (2) The 1961 Census of Agriculture for Alberta, Saskatchewan, and Manitoba classified 6,026 farms as commercial dairy farms, less than 3 per cent of all farms in the Prairie Provinces.

- (3) The group with 1 to 17 head represents an average herd of 9 head of cattle. As the inventories were reported as of June 1, the average herd would have about 4 cows, 1 yearling heifer, and 4 calves. The average annual return from a herd this size would be small. A 1966 study of cow-calf operations by the Economics Division, Alberta Department of Agriculture reported a return to labor and management of \$12.79 per cow wintered. If this figure is used, the group of farms reporting 1 to 17 head of cattle would obtain an average annual return to labor and management from the cattle enterprise of about \$50. In other words, cattle herds numbering 1 to 17 head do not contribute significantly to the farm income.

- (4) Gartner, G. J., "The Potential For Increasing Income on Small Farms in the Broadview Area of Southeastern Saskatchewan", *Canadian Farm Economics*, Vol. 2, No. 2, June, 1967, p. 22.

POLICY AND PROGRAM DEVELOPMENTS

Egg Purchases by the Agricultural Products Board—An Order in Council effective April 1, 1968 granted authority to the Agricultural Products Board to purchase up to 100,000 cases of shell eggs by tender at prices up to and including 37 cents per dozen for Grade A Large, with appropriate differentials for other grades as determined by the Board; to store, transport, and process or enter into contracts for the storing, transporting and processing of these eggs and egg products; and to sell egg products at prices determined by the Board, not lower than a price that would result in a net return of less than 25 cents per dozen of shell eggs. (March 14, 1968)

Saskatchewan Turkey Producer's Marketing Order—An Order in Council has given authority to the Saskatchewan Turkey Producer's Marketing Board to regulate the marketing of turkeys outside the Province of Saskatchewan in interprovincial and export trade. (March 21, 1968)

Milk and Cream Stabilization Order—The Agricultural Stabilization Board is authorized, for the purpose of stabilizing the price of milk as designated at the prescribed price, to make payments, with respect to the period April 1, 1967, to March 31, 1968, to the Canadian Dairy Commission, for the benefit of producers of manufacturing milk and cream, as follows:

- (a) the amounts required to reimburse the Canadian Dairy Commission for the cost incurred by it during that period in storing, handling and shipping dairy products acquired by it and for the interest on loans, for storing handling, shipping and acquisition of such products;
- (b) the amounts paid by the Commission during that period, not in excess of \$250,000, for providing information to producers in respect to the program; and
- (c) \$120,400,000. (March 21, 1968)

Federal Aid for Potato Growers—The federal government, working through the Agricultural Stabilization Board, will pay each commercial potato grower \$25 per eligible acre of potatoes up to a maximum of \$400 per farmer based on his 1967 crop. Payments will not be made on crops of one acre or less. (March 27, 1968)

Cheese Support Price—The Canadian Dairy Commission announced that the summer support price for first grade cheddar cheese will be in effect from May 1, 1968. With this adjustment the Commission support price for the 1968-69 dairy year will be 40 cents per pound for cheese produced from April 1 to April 30; for cheese produced from May 1 to November 2—47 cents for 93 score and better, 46½ cents for 92 score and for cheese produced from November 3 to March 31—42 cents. (April 22, 1968)

Support Price for Eggs—The Agricultural Stabilization Board has been authorized to support the price of eggs at 34 cents per dozen, basis Grade A Large national average, for the 1967-68 year. The program covers the 12 month period ending September 30, 1968. The support price will apply from a minimum of 1,000 dozen eggs to a maximum of 10,000 dozen eggs marketed by an eligible producer. As in previous programs, Grade A eggs of Extra Large, Large and Medium size are eligible for support payments. (May 7, 1968)

Dr. Hudson Retires—Dr. S. C. Hudson, Director-General of the Economics Branch, since 1964 retired at the end of April 1968 after nearly 38 years of service with the federal government. (April 1968)

Appointment of Dr. R. P. Poirier—Dr. R. P. Poirier, Assistant Deputy Minister, Economics Branch, Department of Agriculture, has been appointed a member of the Agricultural Stabilization Board and the Agricultural Products Board, vice Mr. S. J. Chagnon who has retired from the Public Service. (April 30, 1968)

PUBLICATIONS

ECONOMICS BRANCH PUBLICATIONS

The Outlook for Poultry Meat in Canada to 1980, Emmery, M.K., Ottawa, Pub. No. 67/12, December, 1967. pp. 38.

This study examines the trends in supply and demand of poultry meat and projects future changes in poultry meat consumption and prices in Canada.

Cattle Ranching in Southern Alberta, Family Operated Commercial Cattle Ranches, Foothills and Shortgrass Regions, Elgaard, K., Regina, Saskatchewan, Pub. 68/3, February, 1968. pp. 33.

This report of a study of cattle ranching practices and associated costs and returns provides information on various phases of beef production in Southern Alberta.

UNITED NATIONS PUBLICATIONS

Available in Canada from the Queen's Printer,
Ottawa

Joint FAO/WHO Expert Committee on Nutrition, Seventh Report, Food and Agriculture Organization of the United Nations, Rome, 1967. pp. iv + 114. Price U.S. \$1.50.

This report discusses the problems of nutrition in the underdeveloped areas of the world which can be solved only through increased food production and better food utilization. The need to maintain a proper balance between food production and population is also stressed in the report.

Agricultural Trade in Europe, Recent Developments (prepared in 1967). The United Kingdom's Foreign Trade in Food, Fruit Juices, Economic Commission for Europe, FAO Agriculture Division of the Secretariat of the Economic Commission for Europe, Geneva, United Nations, New York, 1968. pp. i + 161. Price U.S. \$2.00.

This report on recent developments in European agricultural trade places the main emphasis on composition by commodity divisions and geographical distribution. Three of the more important categories of commodities: cereals, meat and dairy products, are reviewed in this report. Two special parts, one on United Kingdom's trade in food and the other on fruit juices are also included in this report.

Review of Agricultural Situation in Europe at the End of 1967, ECE/FAO Agriculture Division of the Secretariat of the Economic Commission for Europe, Geneva, United Nations, New York, 1968. Vol. I, pp. i + 200, Vol. II, pp. i + 201-378. Price U.S. \$4.50.

This report by the Economic Commission for Europe reviews the grain, meat and livestock, poultry meat, dairy products and eggs, situation in Europe with regard to production, prices and trade.

OECD PUBLICATIONS

Available in Canada from the Queen's Printer, Ottawa.

Production of Fruit and Vegetables in OECD Member Countries, Present Situation and 1970 Prospects, Germany, Austria, Organization for Economic Co-operation and Development, Paris, 1968. pp. 102.

The purpose of this report is to provide information on production, processing and demand prospects for fruit and vegetables on a medium term basis. It is based on reports prepared by Member Countries of the OECD.

OTHER PUBLICATIONS

Not available from Economics Branch

The New Brunswick Economy, 1968, A report to the Legislative Assembly. pp. 96.

This report reviews the economic situation during 1967 and the outlook for 1968 at international, national, provincial and regional levels. Detailed statistics are given for the New Brunswick economy.

Carrot and Onion Production in the Bradford Marsh, Production Costs, Returns and Management Practices, 1965-66, Walter, H.L., Farm Economics, Co-operatives, and Statistics Branch, Ontario Department of Agriculture and Food, January, 1968. pp. 36.

This report provides information on production and management practices, and on costs of production of carrots and onions in the Holland Marsh near Bradford, Ontario.

U.S. Report to FAO, 1964-66, U.S. FAO Inter-agency Committee, U.S. Department of Agriculture, October, 1967. pp. viii + 142.

This report reviews production, marketing, research and extension services pertaining to food and agriculture in the United States and discusses economic incentives given in the development of American agriculture. It also reviews international activities related to food and agriculture including the Food for Freedom Program of the United States.

STATISTICAL APPENDIX

AVERAGE PRICES OF SELECTED CANADIAN FARM COMMODITIES, VARIOUS MARKETS AND GRADES, 1967-68

Commodity, grade and market	1967			1968			
	Average	Mar.	Apr.	Jan.	Feb.	Mar.	Apr.
dollars per cwt.							
CATTLE (weighted average prices at public stockyards)							
Good slaughter steers							
Toronto.....	27.65	26.70	26.00	27.28	26.30	25.55	25.50
Winnipeg.....	26.60	25.56	25.33	26.38	25.42	24.62	25.31
Calgary.....	26.05	24.50	24.15	25.22	24.53	24.24	24.33
Good feeder steers							
Toronto.....	28.70	28.00	28.02	27.51	27.00	27.84	29.00
Winnipeg.....	26.55	25.93	26.15	23.90	25.43	26.01	26.00
Calgary.....	26.40	25.82	25.89	24.81	25.12	25.19	25.70
Good and choice veal calves							
Toronto.....	36.15	38.73	37.95	39.44	38.96	38.39	37.78
Winnipeg.....	38.85	39.44	38.61	39.66	40.83	38.66	39.96
Edmonton.....	30.40	36.25	36.08	29.85	30.68	31.63	33.18
HOGS (weighted average prices at public stockyards, Grade A dressed)							
Toronto.....	30.70	31.69	29.93	28.11	28.60	27.97	26.98
Winnipeg.....	28.55	28.90	27.60	25.78	26.40	26.33	25.49
Calgary.....	27.05	27.00	26.32	24.19	24.71	24.97	23.83
LAMBS (weighted average prices at public stockyards, Good lambs)							
Toronto.....	26.65	25.45	29.13	27.37	27.26	30.17	32.16
Winnipeg.....	21.40	21.50	21.50	23.00	23.41	23.50	24.98
Calgary.....	20.40	19.41	19.36	20.08	21.44	22.29	25.27
FLUID MILK (f.o.b. factory)							
Halifax.....	6.24	6.10	6.10	6.45	6.45	6.45	6.45
Montreal.....	5.96	6.00	6.00	6.00	6.00	6.00	6.00
Toronto.....	5.98	5.75	5.75	6.10	6.10	6.15	6.15
Winnipeg.....	5.84	5.48	—	5.97	5.97	5.97	5.97
Vancouver.....	6.93	6.74	6.77	7.17	7.20	7.22	7.25
MANUFACTURING MILK (average farm value) ^{a,d}							
Nova Scotia.....	3.22	3.05	3.08	3.23	3.22	—	—
New Brunswick.....	3.12	3.11	3.02	3.19	3.25	—	—
Quebec ^b	3.32	3.17	3.29	3.41	3.35	—	—
Ontario ^c	3.28	3.12	3.31	3.37	3.35	—	—
British Columbia.....	3.27	3.17	3.35	3.25	3.28	—	—
cents per lb.							
BUTTERFAT (for butter, average farm value) ^{a,e}							
Prince Edward Island.....	67.7	67.0	68.5	68.0	68.0	—	—
Quebec ^b	64.8	63.5	65.5	65.5	65.5	—	—
Ontario ^c	61.3	59.8	61.4	61.6	61.6	—	—
Saskatchewan.....	62.5	62.6	63.5	62.6	62.6	—	—
British Columbia.....	—	—	—	—	—	—	—
cents per doz.							
EGGS (average paying prices at registered grading stations, Grade A Large)							
Halifax.....	36.3	38.8	34.8	30.8	30.2	33.5	33.4
St. Anselme.....	35.5	36.3	38.4	31.8	29.2	31.6	32.0
London.....	33.4	34.8	33.4	30.1	28.8	30.4	30.9
Winnipeg.....	26.9	27.9	26.0	23.5	23.1	24.1	25.0
Vancouver.....	30.2	30.0	30.5	29.4	32.5	34.4	34.7
cents per lb. live							
BROILERS (average prices paid to growers No. 1 grade chicken under 5 lbs.)							
Toronto.....	19.6	20.0	20.0	20.8	20.5	20.1	20.8
Edmonton.....	21.0	21.5	21.5	21.5	21.5	21.5	21.5
TURKEYS (average prices paid to growers, No. 1 grade, 12-20 lbs.)							
London.....	23.7	23.0	22.5	22.6	23.0	23.0	23.4
Edmonton.....	25.4	25.2	25.0	25.5	—	—	—

AVERAGE PRICES OF SELECTED CANADIAN FARM COMMODITIES, VARIOUS MARKETS AND GRADES, 1967-68
(Concluded)

Commodity grade and market	1966-67	1967		1968			
	Crop Year Average	Mar.	Apr.	Jan.	Feb.	Mar.	Apr.
dollars per cwt.							
POTATOES (Can. No. 1 Table, average prices to growers)							
Prince Edward Island.....	1.21	1.04	0.83	1.57	1.20	1.23	1.30
New Brunswick.....	1.00	0.81	0.57	1.73	1.03	0.95	0.77
Southwestern Ontario.....	1.70	1.63	1.37	2.08	1.95	1.87	1.75
cents & eights per bu.							
EASTERN GRAINS							
Oats (Ont. No. 2 White, f.o.b. shipping points).....	82/2	78	78	85	85	85	85
Barley (Ont. good malting f.o.b. shipping points).....	145	145	145	145	143	137	137
Corn (Ont. No. 2 Yellow, f.o.b. Chatham 15% moisture in carlots).....	152/6	142	142	128/3	129/4	127	128
Soybeans (Ont. No. 2, f.o.b. Chatham).....	306/6	297	307/6	273/7	276/5	276/3	271/3
WESTERN GRAINS (basis in store Fort William/Port Arthur, less freight and elevator handling charges)							
Red Spring Wheat (No. 2 Nor.)							
Winnipeg.....	195/6	196/6	196/7	177/4	177/6	180/2	180
Regina and Edmonton.....	192/2	193.2	193/3	174	174/2	176/6	176/4
Durum Wheat (No. 1 C.W.A.D.)							
Winnipeg.....	213	215/1	210/7	202/2	192/5	189/2	188/4
Regina and Edmonton.....	209/4	211/5	207/3	198/6	189/1	185/6	185
Feed Wheat							
Winnipeg.....	177/3	178/6	178/7	162/4	162/6	165/2	165
Regina and Edmonton.....	173/7	175/2	175/3	159	159/2	161/6	161/4
Oats (No. 1 feed)							
Winnipeg.....	79/4	77/4	78/6	82/7	82/3	82.1	82.6
Regina.....	77/4	75/4	76/6	80/7	80/3	80/1	80/6
Edmonton.....	75/4	73/4	74/6	78/7	78/3	78/1	78/6
Barley (No. 1 feed)							
Winnipeg.....	117/1	111/4	112/7	111/6	112	112	112/2
Regina.....	114/1	108/5	110	108/7	109/1	109/1	109/3
Edmonton.....	111/2	105/6	107/1	106	106/2	106/2	106/4
Rye (No. 2 C.W.)							
Winnipeg.....	125/2	129	129/3	121/3	126/6	130/5	126/1
Regina.....	121/6	125/5	126	115	120/3	124/2	119/6
Edmonton.....	118/5	122/3	122/6	114/6	120/1	124	119/4
Flaxseed (No. 1 C.W.)							
Winnipeg.....	291/3	290/7	292/7	339/4	340/2	333/3	322/4
Regina.....	288/1	287/5	289/5	336/2	337	330/1	319/2
Edmonton.....	284/5	284/1	286/1	332/6	333/4	326/5	315/6
Rapeseed (No. 1 C.W. basis in store Vancouver).....	278/1	294/1	280/5	233/2	231/2	224	213/5

^aSince the average farm values for manufacturing milk and butterfat published by the Dominion Bureau of Statistics (D.B.S.) do not include the Federal subsidies, it is necessary to add, during the 12 months' period ended March 31, 1968, the Federal payment of \$1.21 per 100 pounds of milk testing 3.5% butterfat, of which 11 cents were retained for export aid. The net payment was made directly to producers at the equivalent rate of 31.42 cents per pound of butterfat. The 1967 yearly average figure excludes the Federal payment of 85 cents per 100 pounds (less 7.3 cents for export assistance) for the January-March period.

^bThe 1967 yearly average farm values for manufacturing milk and butterfat to producers in the Province of Quebec exclude a subsidy payment of 10 cents a pound butterfat, made by the Quebec Government, for the January-March period. The policy was terminated on March 31, 1967.

^cThe 1967 yearly average farm values to producers in the Province of Ontario exclude a payment, made by the Ontario Government, for the January-March period of 25 cents a 100 pounds of manufacturing milk and secondary and excess fluid milk delivered to plants, basis 3.5% butterfat. For all cream grading Special and No. 1, the payment was 10 cents a pound butterfat.

^dBeginning January 1, 1968, a new D.B.S. series for the average farm value of manufacturing milk includes all milk used for manufacturing purposes. Milk used for the manufacture of butter was previously excluded.

^eBeginning January 1, 1968, a new D.B.S. series shows the price of butterfat in cream for manufacturing into butter (farm-separated cream) and is not comparable with the previously published series for butterfat, which included the butterfat in milk used for manufacturing into butter.



VOLUME 3 NUMBER 3

AUGUST 1968

CANADIAN FARM ECONOMICS

Commodity Review.....	1
Cycles in Production and Prices of Hogs in Canada and United States, 1953 to 1967..... A. M. Boswell	7
Changes in Production and Gross Returns of Twenty Sheep Enterprises in Southern Ontario, 1964 to 1967..... W. Y. Yang	11
Economics of Grain-Fallow Rotations and Fertilizer Use in the Prairie Provinces..... J. G. MacKenzie	15
Policy and Administration of Public Lands in Sas- atchewan with Particular Reference to Agriculture..... T. F. Joyce	28
Policy and Program Developments.....	32
Publications.....	32
Statistical Appendix.....	34

HON. H. A. OLSON, MINISTER—S. B. WILLIAMS, DEPUTY MINISTER

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CANADIAN FARM ECONOMICS

COMMODITY REVIEW

GRAIN CORN

Grain corn production in Canada increased from 66.3 million bushels in 1966 to 74.1 million bushels in 1967. This was the result of an increase in acreage from 806,000 acres to 876,000 acres and an increase in average yield from 82.2 bushels per acre to 84.6.

Canadian supplies are expected to reach a record high level of 111 million bushels during the 1967-68 season, up from the 95 million bushels of the previous year. The expected increase in supplies is the result of the increased production and an increased flow of imports from the United States. It is estimated that imports of corn from the U.S. during 1967-68 will have reached 30 million bushels compared with 21 million bushels in 1966-67.

Commercial carryover stocks in Canada at the end of the 1967-68 crop year will approach 13.9 million bushels compared with 5.9 million bushels at the end of 1966-67 unless there has been an unusually large increase in corn fed to livestock during recent months.

United States production increased from 4.1 billion bushels in 1966-67 to 4.7 billion bushels in 1967-68, with an increase in acreage from 56.9 million acres to 60.4 million acres and an increase in average yield from 72.3 bushels per acre to 78.2 bushels.

United States supplies are up from 5 billion bushels to 5.5 billion bushels, the result of increased production. Carryover stocks in the U.S. are expected to rise to 1 billion bushels by the end of the 1967-68 crop year, up from 823 million bushels last year.

It is traditional for the market price of corn to fall in both the U.S. and Canada during October and November as the new crop becomes available. This price drop occurred in October 1967, but it was much sharper than in 1966. For example, the Canadian price of corn at Chatham fell from an average of \$1.49 per bushel during September to \$1.24 during November. In a similar fashion, the price of corn at Toledo fell from an average of \$1.16 per bushel during September to \$1.04 during November.

In Canada, this price fall compares with \$1.57 and \$1.48 in September and November respectively, in 1966, and in the U.S., \$1.45 and \$1.34 in 1966. The market price in both Canada and the U.S. fell substantially more than seasonal expectations, and remained lower than the seasonal average due principally to the over-supply of corn in the U.S. In addition, prices for sales off-farm were discounted where farmers had wet corn which they needed to sell.

The prices to Canadian producers are expected to average about \$1.20 per bushel during the 1967-68 season, a price 23 cents lower than the \$1.43 received in 1966-67 while in the U.S. prices are expected to average \$1.05, 24 cents lower than the \$1.29 received during the 1966-67 crop year. Market prices strengthened slightly in December and January, and remained fairly steady to the end of June, about \$1.26 in Canada and \$1.12 in the United States. As the harvest season progresses, prices on both sides of the border will be sensitive to the production estimates for the 1968 corn crop.

Intended acreage figures in Canada show that producers increased their grain corn acreage from 876,000 acres in 1967 to 942,000 acres in 1968, an increase of 8 per cent. Assuming a small increase in yield, this acreage will produce 81 million bushels of corn, up from the production of 74 million bushels last year. With production of 81 million bushels, an increased carryover and imports in the region of 25 million bushels, total supplies of corn in Canada in 1968-69 will be higher than in the 1967-68 crop year.

According to U.S.D.A. reports, harvested acreage will be down in the U.S., but increased yields will result in only a small reduction in production. With an increased carryover, total supplies in the U.S. during 1968-69 are expected to be about 5.4 billion bushels or nearly the same as the current year.

Corn prices in Canada reflect corn prices in the United States, and therefore are not expected to strengthen during the fall and winter of 1968-69 because of adequate corn supplies in the United States.

G. G. Pearson

TABLE 1—GRAIN CORN—ACREAGE, YIELD AND PRODUCTION, CANADA AND UNITED STATES, CROP YEARS 1963-1968

	1963-64	1964-65	1965-66	1966-67	1967-68 (Preliminary)	1968-69 (Forecast)
CANADA						
Harvested acreage (thousand acres).....	552	660	746	806	876	942
Average yield (bushels).....	65.5	80.2	80.0	82.2	84.6	86
Production (thousand bushels).....	36,184	52,965	59,648	66,328	74,083	81,000
UNITED STATES						
Harvested acreage (thousand acres).....	59,227	55,369	55,332	56,933	60,385	55,000
Average yield (bushels).....	67.9	62.9	73.8	72.3	78.2	80
Production (thousand bushels).....	4,091,238	3,484,243	4,084,342	4,117,355	4,722,164	4,400,000

Sources: *Handbook of Agricultural Statistics, Field Crops*, Dominion Bureau of Statistics.
Feed Situation, United States Department of Agriculture, February, 1968.

TABLE 2—GRAIN CORN—SUPPLY AND PRICE SITUATION, CANADA AND UNITED STATES, CROP YEARS, 1963-1968

	1963-64	1964-65	1965-66	1966-67	1967-68 (Preliminary)	1968-69 (Forecast)
CANADA						
	thousand bushels					
Commercial stocks at August 1.....	4,105	3,974	6,261	5,571	5,870	13,903
Production.....	36,184	52,840	59,498	66,328	74,083	81,000
Imports.....	23,423	17,817	23,897	22,871	31,200	25,000
Total supply.....	63,712	74,631	89,656	94,950	111,153	119,903
Exports.....	320	480	530	273	250	
Domestic utilization.....	59,419	67,890	83,375	88,807	97,000	
Commercial stocks at July 31.....	3,974	6,261	5,751	5,870	13,903	
	Can. dollars per bushel					
Average farm price.....	1.37	1.30	1.30	1.43	1.20	
UNITED STATES						
	million bushels					
Carryover stocks at October 1.....	1,365	1,537	1,147	840	823	1,000
Production.....	4,019	3,484	4,084	4,117	4,722	4,400
Imports.....	1	1	1	1	1	1
Total supply.....	5,385	5,022	5,232	4,958	5,548	5,400
Exports.....	500	570	687	488	640	
Domestic utilization.....	3,348	3,305	3,705	3,647	3,906	
Carryover stocks at September 30.....	1,537	1,147	840	823	1,000	
	U.S. dollars per bushel					
Average farm price.....	1.11	1.17	1.16	1.24	1.05	

Sources: Dominion Bureau of Statistics.
Feed Situation, United States Department of Agriculture, February, 1968.

DAIRY PRODUCTS

Europe and North America are the predominant commercial milk-producing areas of the world and any substantial changes in the dairy situation in these areas seriously affect international trade patterns. Economic developments of recent years have contributed to a trend towards concentration of the industry in all major milk-producing countries. Dairy farming has become more specialized—there are fewer farmers, herds are larger, milk yields per cow have risen and increased mechanization has occurred at both the farm and factory levels. There has also been an increase in deliveries of whole milk rather than cream to the factories, thus increasing the amount of skim milk available for manufacture.

All major dairy exporting countries support their

dairy industries by some form of farm price or income assistance. Dairy supports in many Western European countries are tied in with increasing meat production. In the European Economic Community, the recent move towards a common dairy policy has, by attractive support prices, stimulated milk production. Most Eastern European countries also have policies directed toward increased output of milk.

Milk production in all major producing areas, except North America, has been increasing in recent years. Important factors restraining milk production in North America include the rising costs of producing milk; the capital investment required to expand operations; alternative opportunities, both on-farm and off-farm; and the difficulties in obtaining adequate farm labour.

The average annual output of milk in 35 countries, accounting for about 85 per cent of world production, was more than 8 per cent greater in 1967 than in 1964 and about 21 per cent greater than the average for the five-year period, 1956-60. Production in the European Economic Community increased by more than 9 per cent between 1964 and 1967. Substantial gains were also recorded in Eastern European countries, particularly the Soviet Union, where an increase of nearly 30 per cent occurred during the same period.

World milk production in 1967 is estimated to have been 2 per cent above the previous year's output and indications are that the upward trend will continue during 1968. A decrease in milk for fluid use has accompanied the increase in total production. A result of this expanded milk production is that supplies of manufacturing milk and of the resultant dairy products are very much in excess of commercial market demand. The impact of these larger supplies is being felt in the countries which have traditionally exported dairy products. The increase in milk production in Western Europe since 1965, without a corresponding increase in consumption, has resulted in the accumulation of large stocks of dairy products, particularly butter and skim milk powder. On April 1, 1968, the European Economic Community had almost 400 million pounds of butter in storage. Other European countries also had larger stocks of butter on April 1 than on the same date the previous year.

The United Kingdom market, which accounts for about 75 per cent of the world butter trade, operates under an import quota system, thereby limiting shipments and sharing them among regular suppliers. The remaining 25 per cent of world butter trade is not so regulated and is subjected to intense price competition with export offerings being made at prices substantially below the domestic price of the supplying countries.

Cheese production increased in many Western European countries as milk was diverted from butter production. Output in the E.E.C. increased by about 5 per cent and, for the first time, the Community had an export surplus. Substantial increases were recorded in Switzerland and in the Irish Republic. Production was also higher in the United Kingdom. A development of the higher production in the E.E.C. was an increase in exports to the United Kingdom of cheddar-type cheese at prices considerably lower than those offered by the traditional suppliers to this market. In June, 1968, European cheeses, including some types of cheddar, could be purchased at prices as low as 20 cents a pound, delivered at Montreal, and some fancy cheeses were offered at prices less than 20 cents a pound.

Nearly all of the major milk-producing countries, except the United States, are experiencing a build-up of skim milk powder stocks. Production in France increased rapidly during the past 5 years, increasing from 494 million pounds in 1963 to around 1,200 million pounds in 1967. On a percentage basis, West Germany production recorded even greater gains, increasing from 278 million pounds to 744 million pounds during the same period.

In former years, skim milk powder production in Western Europe was largely absorbed domestically for livestock feeding and human food. Production is now greater than domestic commercial disappearance. The saturation of the skim powder market and the subsidization of exports by European countries to reduce stocks has had a drastic effect on world prices. In May, 1968, skim powder was being sold by certain countries at substantially less than 5 cents a pound, f.o.b. the supplying country.

Large quantities of skim milk are used in the manufacture of casein, a product which is used in various edible forms as well as for industrial purposes. The four major casein-producing countries are New Zealand, Australia, Argentina and France, which account for more than 85 per cent of the product entering international trade. Shipments of casein into all the main importing countries, with the exception of Japan, declined in 1967. Imports into the United States—the world's largest importer—were 5 per cent less than a year earlier. The decline in the United States imports in 1967 was largely attributed to the decline in home building starts—casein is used extensively in building materials.

World prices for casein in 1966 and 1967 were considerably below the price level prevalent in 1965. The average wholesale price for fine ground casein from the Argentine, f.o.b. New York, was 37.8 cents per pound in 1965, 24.7 cents in 1966, and 24.1 cents in 1967.

Production and consumption of milk and dairy products in Canada, on a milk fat basis, have been about in balance during the past three years. It is only on a solids-not-fat basis, in the form of skim milk powder that Canada has any large surplus.

In 1967, Canada exported 28 million pounds of cheese—mostly cheddar—which was largely counterbalanced by imports of 24 million pounds of foreign type cheeses. About 90 per cent of Canada's cheese exports went to the United Kingdom in 1967, in comparison with the 1963-67 average of about 94 per cent. The decrease in exports in 1967 was largely due to a lag in deliveries to the United Kingdom.

Canadian exports of whole milk powder in 1967, at 4.8 million pounds, were down about 27 per cent from 1966 and 74 per cent from 1965. The change from 1965 was due to drastically reduced

exports to Venezuela, as a result of Venezuela's attempt to increase milk production at home and Canada's competitive position. The other main suppliers of whole milk powder to Venezuela are Denmark, the Netherlands and Ireland, which are offering whole milk powder at prices ranging from 30 to 40 per cent lower than Canadian prices. Canada's exports of whole milk powder in 1968 are expected to be at the lowest level in nearly 25 years.

Canada exports skim milk powder to countries around the world—in 1967, shipments totalling 96 million pounds were made to some 40 countries. Canadian skim powder exports fluctuate considerably from year to year, according to the supply and demand situation and the world price levels. Canada also donates dairy products, particularly skim milk powder, to the World Food Program and other United Nations agencies and through bilateral programs.

In 1967, Canada exported about 8 million pounds of casein, compared with 17 million pounds the previous year. Canadian exports of casein and caseinates have been significant only since 1961, when about 8 million pounds were exported (Table 1). The bulk of Canada's casein exports goes to the United States, where the product competes with other suppliers such as New Zealand, the Argentine, Australia, Poland and France.

Because of the large volume of dairy production throughout the world and the low prices at which some products are being offered, there appears to be little prospect of expanding Canadian export markets. Under these circumstances, production of milk and dairy products in Canada should not exceed domestic demand if dairy revenues are not to be depressed. Accordingly, the Canadian Dairy Commission, through its quota system, relates subsidy payments to expected domestic demand.

V. McCormick.

TABLE 1—ESTIMATED MILK PRODUCTION IN IMPORTANT PRODUCING AREAS, 1956–60 AVERAGE AND 1964 to 67 ANNUAL

Area	1956-60 Average	1964	1965	1966 ^a	1967 ^a	Change 1964 to 1967
		million pounds				per cent
North America.....	140,907	145,472	142,533	138,267	137,494	— 5.5
United States.....	123,500	126,967	124,173	119,892	119,294	— 6.0
Latin America.....	32,737	40,190	41,367	44,864	45,307	+12.7
Western Europe.....	200,304	230,431	229,736	234,107	237,990	+ 3.3
The E.E.C.....	127,762	145,489	150,970	155,751	159,092	+ 9.3
United Kingdom ^b	22,295	24,086	25,102	24,858	25,390	+ 5.4
Eastern Europe.....	167,619	184,858	210,030	220,785	228,617	+23.7
The U.S.S.R.....	107,099	119,048	141,672	147,990	154,322	+29.6
Poland.....	25,560	27,785	29,417	31,382	31,746	+14.2
Asia (Japan).....	3,380	6,658	7,101	7,527	7,892	+18.5
Oceania.....	25,527	28,608	29,104	30,384	30,864	+ 7.9
TOTAL ^c	570,474	636,217	659,871	675,934	688,164	+ 8.2

^a Preliminary.

^b Commercial use only.

^c 35 countries—about 85 per cent of the world's milk supply.

TABLE 2—EXPORTS OF CERTAIN DAIRY PRODUCTS, CANADA, 1958 TO 1967

Year	Cheese	Skim Milk	Whole Milk	Casein	Butter and Butter Oil ^a
			pounds		
1958.....	15,701	46,488	17,530	675	5
1959.....	20,009	110,543	18,401	908	10,504
1960.....	18,780	47,992	36,729	1,873	3,014
1961.....	19,508	53,090	25,790	7,855	9
1962.....	27,252	35,689	20,203	13,850	4
1963.....	25,823	55,556	17,111	15,950	5,609
1964.....	31,658	42,139	18,449	12,201	113,647
1965.....	32,055	86,258	19,653	15,824	5,341
1966.....	35,949	69,447	6,710	17,288	661
1967.....	27,683	94,973	4,872	8,262	55

^a Butter oil in butter equivalent.

EGGS

In Canada at June 1, 1968, the number of layers was about equal to the number at June 1, 1967 (Table 1). However, a reduction of about 16 per cent in the number of pullet chicks placed in Canada for layer replacement purposes during the first five months in 1968 will cause the number of pullet layers to fall below last year's level during the last half of 1968. By September 1968, pullet layer numbers in Canada will total 21.4 million compared with 22.4 million in June, 1968 and 22.8 million in September, 1967. This will represent a drop of 6 per cent from September 1967 to September 1968.

TABLE 1—ESTIMATED PULLET LAYER NUMBERS IN CANADA, BY MONTH, 1967 AND 1968

	1967	1968
	million head	
January.....	21.0	23.1
February.....	21.3	23.0
March.....	21.7	22.8
April.....	22.0	22.7
May.....	22.3	22.6
June.....	22.6	22.4
July.....	22.8	22.1
August.....	23.0	21.9
September.....	22.8	21.4
October.....	23.1	21.0
November.....	23.4	20.3
December.....	23.2	

Source: Canada Department of Agriculture.

In the United States, flock numbers at June 1, 1968 were estimated by the United States Department of Agriculture to be the same as a year earlier. This represented a steady reduction from the peak cyclical and seasonal level of last winter. The downward trend in layer numbers will continue during the second half of 1968. According to reports, hatches of layer stocks in the United States were 16 per cent lower in the early months of 1968 than in the same period of 1967.

Egg marketings by producers at registered stations in Canada to June 29, 1968 totaled 4.5 million cases, up 7.4 per cent from marketings in the same period of 1967 (Table 2). Marketings probably reached a peak in May and June and are forecast to decline both seasonally and cyclically during the remainder of 1968. The same general outlook for egg marketings prevails in the United States.

Egg prices to producers in Canada were consistently below the national support level of 34 cents a dozen for Grade A Large from early November, 1967 to the end of June, 1968 (Table 3). They are expected to rise above earlier levels during the summer and by fall could be higher than June levels.

Shell egg imports from the United States were few from January until Easter, but rose quite sharply in late April due to a sharp break in U.S. price levels at that time. Wholesale prices of Grade A Large eggs at Toronto decreased in late April and a small increase in U.S. wholesale prices resulted in fewer shell egg imports during May. A further increase in U.S. wholesale egg price levels in June in combination with heavy egg marketings in Canada resulted in a complete halt in imports. Shell egg imports to June 22, 1968 totaled 62,000 cases compared with 151,000 cases during the same period in 1967. All of these imports originated in the United States.

TABLE 2—MONTHLY EGG MARKETINGS AT REGISTERED STATIONS IN CANADA, 1967, AND ACTUAL AND FORECAST 1968, AND SHELL EGG IMPORTS TO CANADA 1967 AND 1968

	1967		1968	
	Market- ings	Imports	Market- ings	Imports
	thousands of cases of 30 dozen			
January.....	708	8	802	2
February.....	632	15	711	2
March.....	690	18	735	7
April.....	671	57	765	24
May.....	762	38	781	23
June.....	738	16	745 ^a	6
July.....	739	9	725 ^b	
August.....	721	16	700 ^b	
September.....	695	16	670 ^b	
October.....	712	56	650 ^b	
November.....	706	33	625 ^b	
December.....	733	19		
Year.....	8,508	301		

^a preliminary.

^b forecast.

TABLE 3—MONTHLY AVERAGE EGG PRICES TO PRODUCERS AT REGISTERED STATIONS IN CANADA, 1967 AND 1968

	Grade A Large		All Grades	
	1967	1968	1967	1968
	cents per dozen		cents per dozen	
January.....	28.6	30.7	35.3	26.0
February.....	33.2	29.6	29.8	25.9
March.....	33.6	31.0	29.9	27.9
April.....	33.6	32.3	29.9	28.6
May.....	30.2	30.6	26.4	26.6
June.....	28.5	30.2	23.8	26.0
July.....	28.7		23.8	
August.....	35.8		28.4	
September.....	35.2		28.3	
October.....	35.4		29.2	
November.....	33.6		28.3	
December.....	33.8		29.0	
Year.....	33.1		28.4	

Egg marketings are expected to decline cyclically and seasonally from July until the year end in both Canada and the U.S. While the pressure of heavy Canadian marketings reduced the flow of imports

from the United States during the first half of 1968, imports could be substantial during the last quarter of 1968 when Canadian marketings are expected to reach their low point. However, egg prices in Canada at that time should be well above the support level and U.S. supplies, which will help meet consumer demand, are unlikely to have any severe price depressing effects.

J. D. F. Kidd

POTATOES

The potato crops of Canada and United States are produced and marketed under similar conditions and to a large extent are traded as though they were in a single market. A large crop in the United States can set effective limits on the price of Canadian potatoes even though the Canadian crop is light. A small crop in the United States can be reflected in strong prices in both countries despite a heavy Canadian crop. However, as a result of economic, geographic and weather factors the potato crops of the two countries usually increase or decrease together.

The combined Canada and United States potato production for 1967-68 was 276.5 million hundredweight. This was 2 per cent less than the year before but 9 per cent greater than the 1962-66 average. Canadian production was 44.4 million hundredweight and due to a reduction in acreage was about 19 per cent less than the previous year. United States production was 232 million hundredweight, an increase of about 2 per cent above the high 1966-67 crop level, due to increased plantings.

Beginning in October and extending through April there were considerably higher than average imports of United States potatoes into Canada and considerably lower Canadian exports. This was a result of the relatively small Canadian crop and of the larger United States supplies.

At January 1, 1968, Canadian potato stocks were 19.5 million hundredweight, compared with 27.5 million hundredweight the year before. The reduction of stocks in Canada was more than off-

set by an increase in the stocks in the United States so that the combined total stocks at January 1, 1968 amounted to 160.5 million hundredweight, compared with 158.9 million hundredweight a year earlier. This overall increase was less than proportional to population growth for the period but was sufficiently above average levels to have a depressing effect on prices.

On January 8, 1968 the United States Department of Agriculture announced a diversion program and a limited purchase program to help alleviate the situation. By mid-January the price of Maine potatoes at New York rose for a brief period but by the end of the month started a decline which continued to mid-April with stocks remaining at levels which were higher than those of other recent years. In Canada stocks also remained high and prices stayed only slightly above the low level of the previous year. On March 27, 1968 the Canada Department of Agriculture announced an assistance program based on an acreage payment of \$25.00 per eligible acre to commercial growers. The program was applicable to acreages in excess of one acre and subject to a maximum of 16 acres per grower.

About the end of April, Maine potato prices at the New York market started to rise and continued upwards until the final market reporting date of the season so that at June 7 prices were much higher than the previous year.

During March and April the Canadian stock position returned to normal and early in May prices rose on the Toronto and Montreal markets. By early June they were much higher than the previous year and prices to producers were more than double those of a year earlier.

Acreage in 1958 is expected to be down from 1967 by 4 per cent in Canada and 5 per cent in the United States. It would thus require above average yields in order to repeat the market difficulties of 1966 and 1967. Potato prices should be stronger in 1968-69 and if yields are low prices could be substantially higher than in 1967-68.

J. R. Burns and E. S. Eaton

CYCLES IN PRODUCTION AND PRICES OF HOGS IN CANADA AND UNITED STATES, 1953 TO 1967

A. M. Boswell

In 1950, the United Kingdom brought the purchases of Canadian pork to an end. The effect of the loss of Canada's export market has been offset by a growing domestic market and the development of the United States as an export outlet. Since the early 1950's, nearly all of Canada's pork exports have gone to the United States.

In 1952, following a severe outbreak of vesicular exanthema in the United States, Canada prohibited the importation of swine and uncooked pork and pork products from that country. With the eradication of the disease these restrictions were removed in 1960. Since then, the movement of pork and pork products has been both ways, thus tending to equate prices in both countries, taking into account transport, tariff and exchange costs and quality differences. As a result, Canadian hog producers since 1960 have operated on a two-country market whereas between 1952 and 1960 the Canadian hog industry was partly protected from the full impact of any excess supply or low price situation in the United States.

The close trade relationships and the proximity of the Canadian and U.S. hog industries results in similar base-point pricing and price movements, within what is commonly referred to as a "North American Economy". This means that hog prices in Canada are directly related to price levels of hogs in the larger U.S. market. This has been effective since 1952, with the development of the U.S. export

outlet and in particular since 1960 when bilateral pork trade became common.

As an aid in understanding some of the changes which have taken place in the North American hog market and in forecasting probable production and prices, it is useful to examine some of the general characteristics of the Canadian and U.S. hog industries since 1953, both in terms of production and price patterns.

Aside from seasonal variations of hog production and price, there are long-range production and price patterns commonly referred to as "cycles". Hog production cycles may be measured at the initial or final stage; that is, size of pig crop or volume of hog slaughter. Hog price cycles may be described in terms of product prices, for example, the market price of slaughter hogs.

PRODUCTION CYCLES

Hog production cycles in both the United States and Canada are measured in terms of annual commercial (inspected plus uninspected) hog slaughter (Table 1). Cycles of hog production in the U.S. are about four years in length. According to U.S. market analysts, there are roughly two years of low pork production, followed by two years of high pork production. The main theory advanced is that whenever hog prices are low or profit margins unfavorable, hog producers tend to cut production.

TABLE 1—HOG PRODUCTION CYCLES, UNITED STATES AND CANADA, 1953 TO 1968

Year	U.S. Commercial Slaughter			Canada Commercial Slaughter		
	Annual Total	2-Year Average	2-Year Change	Annual Total	2-Year Average	2-Year Change
	million head		per cent	million head		per cent
1953\	66.9\			6.2\		
1954\ Low	64.8\	65.8		6.1\	6.1	
1955\	74.2\			6.9\		
1956\ High	78.5\	76.3	+16	6.9\	6.9	+13
1957\	72.6\			6.3\		
1958\ Low	71.0\	71.8	-6	7.4\	6.8	-1
1959\	81.6\			9.7\		
1960\ High	79.0\	80.3	+12	7.8\	8.7	+27
1961\	77.3\			7.5\		
1962\ Low	79.3\	78.3	-3	7.6\	7.6	-13
1963\	83.3\			7.6\		
1964\ High	83.0\	83.1	+6	8.3\	7.9	+4
1965\	73.8\			8.1\		
1966\ Low	74.0\	73.9	-11	8.0\	8.0	+1
1967\	82.2\			9.2\		
1968\ High						

Sources: *Livestock and Meat Statistics*, United States Department of Agriculture, Annual, Washington, D.C.
Livestock and Animal Products Statistics, Annual, Catalogue No. 23-203, Dominion Bureau of Statistics, Ottawa

This gradually reduces slaughterings and prices rise. When profit margins become favorable, hog farmers increase production and prices eventually decline. The composite effect of these decisions by individual producers leads to cyclical increases and decreases in hog production each of which are about two years in duration.

Since 1953 there have been three complete four-year hog production cycles in the United States. The current hog production cycle which started in 1965 increased sharply in both Canada and the U.S. between 1966 and 1967. For 1968, slaughterings in both countries are expected to be close to 1967 levels.

Although hog production in the U.S. has followed a regular cycle since the early 1950's; this has not been as evident in Canada. Over three-fourths of U.S. hog production is located in 10 corn belt states under comparable feed and market conditions. In contrast, about 60 per cent of Canada's hog production is located in the Eastern provinces with the Western provinces accounting for the balance. Between Western and Eastern Canada, the pattern of hog slaughter tends to vary reflecting in part the different levels of feed supply on the farm and methods of hog production.

PRICE CYCLES

Prices on the Chicago and Toronto hog markets illustrate the relationship of cycles in hog prices within and between Canada and the United States (Table 2).

Aside from seasonal price fluctuations, the periodicity of hog prices has tended to follow a four-year cycle in both countries. For example, in both countries hog prices moved upward for about two years beginning in 1953 and then moved downward during the two years beginning in 1955. This approximated a four-year cycle from low to low. The hog industry in both Canada and the United States has experienced three such complete hog price cycles during the period 1953 to 1964. The present price cycle began in 1965, reached its peak in both countries in 1966 and then declined in 1967. For 1968, hog prices at Chicago and Toronto are expected to average slightly below 1967 levels.

Unlike the cycles in hog production, the cycles of hog prices in both countries have followed the same general pattern. Hog prices in both countries advanced to peaks in the two year periods 1953-54, 1957-58, 1961-62 and 1965-66. They declined to lows in 1955-56, 1959-60 and 1963-64, and followed the same pattern between 1966 and 1967. The sharp increase in hog prices in Canada in 1965 and 1966 was not in response to changes in domestic supplies but was a result of a sharp decrease in U.S. hog production. This reflects in part the fact that hog slaughterings in Canada contribute about 10 per cent of the combined supply in the two countries.

Producers of hogs in Canada and the United States have experienced extreme variations in prices during the period 1953 to 1967. Both had very low hog prices in 1959 and record high prices in

TABLE 2—HOG PRICE CYCLES^a, UNITED STATES AND CANADA, 1953 TO 1968

Year	Chicago (live, 200-220 pounds)			Toronto (dressed)		
	Nos. 1, 2 and 3	2-Year Average	2-Year Change	Grade "A"	2-Year Average	2-Year Change
	U.S. dollars per hundred pounds			Can. dollars per hundred pounds		
1953	22.99			30.80		
1954	23.48			31.75		
1955	16.41	23.24		26.05	31.28	
1956	15.53	15.97	-7.27	27.50	26.78	-4.50
1957	18.93			31.05		
1958	21.01	19.97	+4.00	29.13	30.09	+3.31
1959	15.21			24.80		
1960	16.65	15.93	-4.04	24.75	24.78	-5.31
1961	17.78			28.30		
1962	17.52	17.65	+1.72	29.60	28.95	+4.17
1963	16.07			27.80		
1964	16.16	16.12	-1.53	27.30	27.55	-1.40
1965	22.29			33.40		
1966	24.82	23.56	+7.44	35.90	34.65	+7.10
1967	20.49			30.70		
1968						

^a Hog prices in the U.S. are determined on a live weight basis and in Canada on a dressed weight basis.

Sources: *Livestock and Meat Statistics*, United States Department of Agriculture, Annual, Washington, D.C.
Livestock and Animal Products Statistics, Annual, Catalogue No. 23-203, Dominion Bureau of Statistics, Ottawa

1966. Throughout the downswing of hog prices in 1967, in both Canada and the U.S., prices have been at relatively high levels compared with the historic pattern when prices turned lower due to increased slaughter. This higher price pattern indicates that hog prices in recent years have reached a new plateau from which to stage the ups and downs in the hog production cycle. For example, the annual average price of Grade "A" carcasses at Toronto has not been below \$30 per hundred pounds since 1964.

NORTH AMERICAN PATTERNS

A comparison of production, price and consumption patterns indicates that the Canadian hog producer operates in an economy which is North American rather than Canadian (Table 3). While trade with other foreign countries is important, it presently has little effect on the basic North American economy for hog producers and it is not expected to have any greater effect in the near future.

Since 1953, hog producers in Canada and the United States have been confronted with an inverse relationship between hog slaughter and price. There has been a regular pattern of approximately two years of low production and high prices followed by two years of higher production and lower prices. In both countries, per capita consumption of pork moves in the opposite direction to hog prices with two years of low consumption followed by two years of high consumption.

In the United States, price supports and storage programs for corn during the post-war period have brought appreciable stability to the annual supply and price of corn. While feed remains the primary expense item, variations in the "hog-corn price ratio", now arise more often from changes in the price of hogs and less often from changes in the price of corn. As a result, hog prices in the United States have assumed a more prominent role in determining hog production in recent years.

SUMMARY

Whatever the practical implications are, it is clear that since the early 1950's, fairly distinct cycles in hog production and prices have existed in the North American hog market. In response to changes in hog prices, there will continue to be some contraction and expansion of hog production in the foreseeable future. However, as a result of the trend to fewer and larger specialized producers, fluctuations in slaughter levels may be more moderate in the future. Continued stabilization of feed grain prices in the United States may also contribute to reduced fluctuations in hog prices in both countries.

A familiarity with the existence and operation of these production and price patterns may be of help to livestock forecasters and policy makers. Canadian hog producers should also recognize the fairly regular swings in hog prices that characterize

TABLE 3—HOG PRODUCTION, PRICE AND CONSUMPTION CYCLES, UNITED STATES AND CANADA, 1953-54 TO 1967-68

Year	Commercial Slaughter, 2-Year Average			Hog Prices ^a 2-Year Average		Per Capita Consumption 2-Year Average	
	U.S.	Canada	Total U.S. and Canada	U.S.	Canada	U.S.	Canada
	million head			dollars per hundred pounds		pounds	
1953-54.....	65.8	6.1	71.9	23.24	31.28	61.8	47.0
1955-56.....	76.3	6.9	83.2	15.97	26.78	67.0	49.2
1957-58.....	71.8	6.8	78.6	19.97	30.09	60.6	46.9
1959-60.....	80.3	8.7	89.0	15.93	24.78	66.4	54.2
1961-62.....	78.3	7.6	85.9	17.65	28.95	63.0	49.8
1963-64.....	83.1	7.9	91.0	16.12	27.55	65.4	51.4
1965-66.....	73.9	8.0	81.9	23.56	34.65	58.2	48.4
1967-68 ^b	82.2	9.2	91.4	20.49	30.70	63.9	53.7

^a U.S. price is for live barrows and gilts at Chicago, (Nos. 1, 2 and 3, 200-220 pounds) and Canada price is for Grade "A" carcasses at Toronto.

^b Based on 1967 data, 1968 production and price data for U.S. and Canada expected to be close to 1967 levels.

Sources: *Livestock and Meat Statistics*, United States Department of Agriculture, Annual, Washington, D.C.
Livestock and Animal Products Statistics, Annual, Catalogue No. 23-203, Dominion Bureau of Statistics, Ottawa

the North American market if they want to maximize returns from hog production.

There is a favorable outlook for the Canadian hog industry both domestically and within the North American market. Per capita consumption of pork would have to increase at least 10 pounds before equalling the present consumption rate in the United States. However, if Canadian hog producers are to continue to utilize and extend their valuable export outlet in the United States, they

must keep abreast of improvements in hog production and quality.

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CHANGES IN PRODUCTION AND GROSS RETURNS OF TWENTY SHEEP ENTERPRISES IN SOUTHERN ONTARIO, 1964 TO 1967 (1)

W. Y. Yang

This is a report of the changes from 1964 to 1967 in the organization and income of 20 sheep enterprises in Southern Ontario (2). Comments on the sheep industry are included as a basis for general comparison. This small sample of farms is not assumed to be representative of all sheep enterprises in Southern Ontario, but the implications may be useful to farmers in comparable situations and to rural leaders and administrators.

This paper will be confined primarily to changes in certain organizational features and to the production and gross returns from both wool and lambs.

A recent report of the Ontario Department of Agriculture and Food shows costs and returns of 38 sheep enterprises, as well as management factors affecting their variation (3).

SIZE AND ORGANIZATION OF THE SHEEP ENTERPRISE

Sheep raising in Southern Ontario is usually carried out as part of a mixed livestock or crop combination farming operation. However, for the 20 farms surveyed, the trend from 1964 to 1967 was toward specialization in sheep. Three of the 20 enterprises were specialized sheep farms in 1964 and 6 were specialized in 1967. The 14 remaining enterprises were on farms with various combinations of other farming activities.

Between 1964 and 1967 the average area of the 20 farms increased from 382 acres per farm to 394 acres per farm. In 1967 the average farm included 31 acres of small grains, 6 acres of corn for silage, 82 acres of alfalfa, clover and timothy mixed, 142 acres in rotation pasture, 74 acres in permanent pasture and slightly over one acre was devoted to special cash crops such as tobacco and rape. The remaining 58 acres were unimproved land and yards around buildings.

The average number of lambing ewes per flock was 209 in 1964 and 216 in 1967, representing an increase in the average size of more than 3 per cent during the three years. In 1964, there were 7 farms with flocks of more than 200 lambing ewes, whereas in 1967, there were 8. Seven of these 20 farms had fewer than 100 lambing ewes in 1964 but only 4 had fewer than 100 in 1967.

WOOL PRODUCTION

Average wool production per farm for all flocks was 2,000 pounds in both 1964 and 1967 (Table 1). The large flock group had an average increase in production per farm of 200 pounds from 1964 to 1967. This increase was mainly due to the increase in the average size of flock.

Generally speaking, wool yields remained the same in 1967 as in 1964 at about 8 pounds per fleece. There was, however, some improvement in quality as evidenced by a higher percentage of graded wool eligible for government price support, 89.8 per cent in 1967 as compared with 86.7 per cent in 1964.

Receipts from the sale of wool decreased more than 43 per cent from an average of \$663 per flock in 1964 to \$375 per flock in 1967. This decrease in receipts was caused by a drop in market price. The government deficiency payments per flock more than doubled from 1964 to 1967 because the quality of wool sold was higher, therefore, total returns per flock from wool production decreased only slightly.

Among the three size groups, the largest flock group received higher returns from wool sales in 1967 than in 1964 but returns to the small and medium size groups were lower in 1967. The increase in the receipts of the large flock group was due to larger volumes of wool sales in 1967; rela-

TABLE 1—WOOL PRODUCTION, SALES AND DEFICIENCY PAYMENTS, 20 SHEEP ENTERPRISES IN SOUTHERN ONTARIO, 1964 AND 1967

Size of Flock	Number of Farms		Wool production Per Farm		Cash Receipts from Wool Per Farm					
					Sales		Deficiency Payments		Total	
	1964	1967	1964	1967	1964	1967	1964	1967	1964	1967
	hundred pounds				dollars					
More than 200 ewes....	7	8	35	37	1,194	710	400	900	1,594	1,610
101 to 200 ewes.....	6	8	11	11	363	182	119	261	482	443
51 to 100 ewes.....	7	4	5	5	199	92	63	118	262	210
All flocks.....	20	20	20	20	663	375	220	488	883	863

tively lower per unit marketing costs; and better quality of wool, much of which would qualify for deficiency payments.

LAMB PRODUCTION

Lamb production went up by 6 per cent from 305 lambs born per flock in 1964 to 322 in 1967 (Table 2). However, the actual number of lambs raised was about 90 per cent of those born in 1964 and 88 per cent in 1967. Some deaths were from natural causes and some were caused by predators such as wolves and stray dogs.

The number of lambs born per 100 ewes averaged 145 in 1964 and 146 in 1967. Some ewes were barren but others produced twins, triplets and

even quadruplets. On this basis there was no significant change in the operating efficiency of the 20 sheep enterprises during the period.

The average live weight of lambs raised per flock decreased by 20 per cent from 22,000 pounds in 1964 to 18,000 pounds in 1967 and the average weight per lamb marketed decreased from 87 pounds per lamb to 71 pounds per lamb. This was due to the fact that an increased number of lambs were sold at a much earlier age. In 1964 only a third of the lambs sold were less than 4 to 5 months old but in 1967, over three-quarters were sold at younger ages. These are referred to as half-grown lambs (see footnote to Table 2). This trend might not apply to all sheep enterprises in Ontario but it does reveal a significant change

TABLE 2—LAMBS: NUMBER BORN, RAISED, SOLD, 20 SHEEP ENTERPRISES IN SOUTHERN ONTARIO, 1964 AND 1967

	More than 200 ewes		Size of Flock		51 to 100 ewes		All Flocks	
	1964	1967	1964	1967	1964	1967	1964	1967
Number born per flock.....	529	572	180	185	109	96	305	322
Number born per 100 ewes.....	145	154	145	135	146	155	145	146
Number raised per flock.....	478	503	161	165	98	80	275	284
Liveweight of lambs raised per flock (pounds)	36,513	28,733	13,594	11,773	9,739	7,542	21,990	17,711
Number sold per flock								
Finished market lambs.....	279	49	99	56	86	66	168	55
Half-grown lambs ^a	164	406	48	92	—	—	85	199
All lambs.....	443	455	147	148	86	66	253	255
Half-grown lambs ^a sold as a per cent of all lambs sold.....	37.0	89.2	32.7	62.2	0.6	0.8	33.6	78.0
Average liveweight per lamb sold (pounds)	80.5	62.1	88.0	71.0	98.0	90.8	87.0	71.4
Feed days per lamb sold.....	144	123	178	148	200	174	169	143
Number of lambs kept for replacement....	35	48	14	17	12	14	22	29

^a Half-grown lambs are those sold at lighter weights and much younger ages than those sold in the regular livestock markets.

TABLE 3—LAMBS: VALUE OF PRODUCTION AND SALES, 20 SHEEP ENTERPRISES IN SOUTHERN ONTARIO, 1964 AND 1967

	Size of Flock							
	More than 200 ewes		101 to 200 ewes		51 to 100 ewes		All Flocks	
	1964	1967	1964	1967	1964	1967	1964	1967
dollars								
Production per flock.....	10,454	12,284	3,263	3,824	2,101	1,958	5,907	6,835
Sales per flock								
Finished market lambs ^a	6,904	1,345	2,104	1,382	1,821	1,562	3,967	1,403
Half-grown lambs ^b	2,682	9,593	830	1,960	10	12	1,407	4,624
All lambs.....	9,586	10,938	2,934	3,342	1,831	1,574	5,374	6,027
Average sale value per lamb								
Finished market lambs ^a	24.75	27.45	21.25	24.68	21.17	23.67	23.54	25.28
Half-grown lambs ^b	16.35	23.63	17.33	21.30	20.00	24.00	16.56	23.24
All lambs.....	21.64	24.04	19.96	22.58	21.29	23.85	21.24	23.64

^a Includes Government quality premiums.

^b Half-grown lambs are those sold at lighter weights and much younger ages than those sold in the regular livestock markets.

in the production and marketing of lambs especially in those areas close to large urban centers where the demand for younger and lighter lambs is strong. One reason for this increased demand is the use of this type of lamb in certain eating establishments. Although the overall trend was toward the marketing of younger and lighter lambs, those farmers with small flocks tended to keep lambs longer, and therefore marketed heavier lambs than farms with medium and large size flocks. However, on the basis of returns per lamb the extra work and costs of keeping these lambs longer does not seem justified.

Lambs were marketed through six channels in Ontario: small abattoirs, stockyards, barn sales, packing plants, drovers and butchers, and direct sales to traders of half-grown lambs for restaurants. The average number of lambs sold per farm was 253 in 1964 and 255 in 1967.

Thirteen of the 20 sheepmen interviewed expanded the size of their flocks between 1964 and 1967 in order to improve their efficiency and returns. This expansion required holding ewe lambs off the market.

Total receipts per flock from all lamb sales increased 12 per cent from \$5,374 in 1964 to \$6,027 in 1967 (Table 3). In 1964 average receipts per flock for the large flock group was 5 times as large as the average receipts for the small flock group whereas in 1967, the largest flock group had receipts about 7 times as large as the small flock group.

The average cash receipts per flock for finished market lamb decreased from about \$4,000 in 1964 to about \$1,400 in 1967, while cash receipts for half-grown lambs increased from an average of \$1,400 to \$4,600.

In 1967, average cash receipts per flock for finished market lambs were \$1,345 for the large size group and \$1,562 for the small size group, but differences in the returns for half-grown lambs were much greater between the size groups. The average receipts per flock for half-grown lambs amounted to over \$9,000 for the 8 largest flocks, \$2,000 for the 8 medium sized flocks and only \$12 for the 4 smallest flocks.

Cash receipts per finished market lamb increased on the average, by only 7.4 per cent from \$23.54 in 1964 to \$25.28 in 1967, while the average receipts for half-grown lamb increased by more than 40 per cent, from \$16.56 in 1964 to \$23.24 in 1967. On the basis of average receipts per finished market lamb, it appears that the larger flock owners were in a more favorable position in obtaining higher unit returns because of larger volumes of transaction, better grades, greater bargaining power

and lower unit marketing costs. On the other hand, the large flock owners seemed to have no particular advantage in obtaining higher average returns per unit of half-grown lambs in 1967. On the contrary, returns for half-grown lambs in 1964 were even lower for the larger flocks. This indicates an irrational and unorganized marketing system for half-grown lambs.

By comparing the relative unit receipts of the finished market lambs in 1964 and 1967 with that of the half-grown lambs in the same period, the more favorable development for the larger producers in selling the young and light lambs can be noted. From 1964 to 1967, unit receipts of finished market lambs increased by about 11 per cent for the large size group of farms, but unit receipts of half-grown lambs increased by as much as 45 per cent for the group of largest flocks, as compared with 23 per cent for the medium size group and 20 per cent for the group of smallest flocks.

TOTAL GROSS RETURNS FOR THE SHEEP ENTERPRISE

Generally speaking, all labour required in sheep raising was supplied by the operator and his family, and all feed was produced on the home farm. The following discussion will be limited to total gross cash returns from both wool and lambs.

Total sales of lambs and wool per farm including government price support payments for wool and lamb amounted, on the average, to about \$6,260 in 1964 and \$6,900 in 1967, an increase of more than 10 per cent despite the abrupt drop in the market price of wool (Table 4). Deficiency payments for eligible wool per flock averaged \$220 in 1964 and increased more than twofold to \$488 in 1967 (Table 1). On the other hand, the market bonus for premium lambs decreased from \$244 per farm in 1964 to \$76 per farm in 1967 because more lambs were sold as half-grown lambs. Receipts from lambs represented nearly 86 per cent of the total cash receipts from sheep in 1964, and 88 per cent in 1967. Excluding government price support payments for wool and premium finished market lambs, receipts from the sale of lambs averaged 90 per cent of the gross cash receipts of the sheep enterprise in 1964 and nearly 95 per cent in 1967.

On the average, the value of lambs kept on farms as replacements amounted to about \$500 in 1964 and \$800 in 1967, an increase of more than 50 per cent (Table 4). Taking into consideration the value of lambs for flock expansion and replacement, gross returns per flock averaged \$6,800 in 1964 and \$7,700 in 1967, an increase of more

TABLE 4—TOTAL CASH RECEIPTS PER FLOCK, VALUE OF REPLACEMENTS, AND TOTAL GROSS RETURNS, 20 SHEEP ENTERPRISES IN SOUTHERN ONTARIO, 1964 AND 1967

	Size of Flock							
	More than 200 ewes		101 to 200 ewes		51 to 100 ewes		All Flocks	
	1964	1967	1964	1967	1964	1967	1964	1967
	dollars							
Total cash receipts from wool and lamb sales ^a	11,180	12,548	3,416	3,785	2,093	1,784	6,257	6,890
Value of lambs kept on farm as replacements.....	869	1,346	328	482	270	384	533	808
Total gross returns.....	12,049	13,894	3,744	4,267	2,363	2,168	6,790	7,698

^a Includes cash sales, deficiency payment for quality wool and bonus for premium finished market lambs.

than 13 per cent. The large size group had an average gross return of about \$14,000 in 1967, an increase of over 15 per cent from 1964, while the small flocks had an average gross return of only \$2,200 in 1967, which is about 8 per cent less than in 1964.

CONCLUSIONS

Some conclusions may be drawn from the limited data obtained from this small selected sample. The most significant results relate to changes in the size of enterprise and the relative importance of wool and lambs as a source of income. The results indicate that a flock with fewer than 100 lambing ewes is not likely to be profitable.

Lamb production is the main source of income for a sheep enterprise. Therefore, in order to increase their income, farmers must improve production and management practices by paying more attention to such factors as fertility rate, the feed-meat conversion ratio of lambs, and quality and availability of pasture and hay.

In order to take advantage of the expanding market outlet for younger and lighter lambs, more

lambs should be produced per flock. This could be attained by a careful selection of breeding stock and by staggering the breeding program as much as biologically feasible and technically practical so that the resources, such as barns, equipment, hay and pasture, could be utilized more fully. Improved feeding and housing practices would also help increase income by cutting down on death losses and by increasing the rate of gain. An orderly marketing system especially for the half-grown lambs would cut marketing costs and aid in supplying high quality meat to consumers.

REFERENCES

- (1) This article was prepared from data assembled by Frank Lawrence, formerly Economist, Economics Branch, Canada Department of Agriculture.
- (2) The location of the 20 farms by counties is as follows: 5 in Simcoe, 4 in Grey, 2 each in Frontenac, Huron, Lambton and Peel and 1 each in Grenville, Kent and Lennox-Addington.
- (3) John R. Stephens, *Sheep Production in Ontario, Commercial Enterprises, Costs, Returns and Management*, Ontario Department of Agriculture and Food, Toronto, April 1968.

ECONOMICS OF GRAIN-FALLOW ROTATIONS AND FERTILIZER USE IN THE PRAIRIE PROVINCES

J. G. MacKenzie

Fallowing land in western Canada dates back to pioneer days. As early as 1889 the Dominion Experimental Farms reported that when grain yields were compared on fallow and stubble-seeded land, results greatly favored the fallow land (1). The percentage of cultivated land under fallow has remained fairly constant during the past 50 years and now approximates 30 per cent of the total cultivated acreage in the 3 Prairie Provinces, although the proportion varies by area. In 1966 the proportion of Manitoba improved farm land in fallow was 21 per cent, in Saskatchewan 35 per cent, and in Alberta 24 per cent. In the Brown and Dark Brown Soil Zones fallow occupies about 36 per cent of the improved farm land, compared with 24 per cent in the Black and Grey Wooded Zones.

Many advantages are claimed for fallowing land. First, it spreads the work load more evenly over the summer, allowing more effective use of machinery and labor, an important factor during the horse era. Second, the practice controls weeds, particularly perennial weeds such as Canada thistle and couch grass. Third, it builds up soil moisture reserves that help sustain crops when rainfall is limited during the growing season. Fourth, fallow land accumulates plant nutrients released through the breakdown of soil organic matter for use by crops seeded the following year. In general, it has been considered by many farm operators that having a portion of the cultivated land fallow each year is an important factor in minimizing production risks.

On the other hand, certain disadvantages of fallowing land have become apparent over the past few decades. Under fallow, organic matter and trash cover are reduced and the soil surface is exposed to the erosive forces of wind and water. Also, with the fallow practice, a large part of the improved land is idle each year.

In recent years, many new techniques and farming skills have been developed and applied. It appears that grain crop yields have been maintained, if not increased as a result of the new practices. The question arises, can yields be maintained by eliminating or at least reducing fallow? Fertilizer use, while not a new technique, has increased substantially with an important impact on yields.

Of course, technology other than fertilizer application and fallowing has been successfully adopted in prairie grain growing operations. New and improved varieties have given protection against disease.

Earlier maturity lessened frost hazard. Cultural methods and tillage practices have changed during the past two decades. One farm operator with modern power equipment now accomplishes the same work as that formerly done by several men working with horses. The more timely pre-seeding and seeding operations allowed by the large power and machine units can reduce weeds, conserve moisture, ensure better seed germination, and earlier growth. Use of mechanized tillage equipment controls weeds on fallow with a minimum of operations, maintaining trash cover and controlling erosion. Swathing and combining speed up harvest and permit time for fall tillage of stubble land when desired. One of the most important innovations has been the development and use of herbicides for weed control in growing crops. Most of the common weeds can be controlled by herbicides.

Chemical fertilizers are being used to replace nitrogen and phosphorus lost from the soil by cropping, leaching and fixation into forms unavailable to crop plants. Soil testing services can provide specific recommendations for individual fields. Sales of fertilizer materials and mixed fertilizers in Manitoba, Saskatchewan and Alberta have increased from less than 100,000 tons in 1958 to 870,000 tons in 1967. The use of fertilizers is expected to increase crop yields on both fallow and stubble-seeded crops. Experiments and farm use substantiate this. The level of yield increases on fertilized stubble-seeded crops is one factor which may determine whether it is more profitable to recrop a particular field in a given year or have it fallow. Soil and plant scientists now suggest that with the use of fertilizers, stubble cropping may be increased in the Prairie Provinces.

PURPOSE OF STUDY

This article examines the possibility of reducing land in summerfallow, under a general assumption that innovations and technological changes and practices, including fertilizer use, make it possible to maintain, if not increase yields over the levels achieved by using fallow.

An increase in stubble cropping will increase total production. Associated with the added value of the increased production will be the increased cost of fertilizer and changes in other production costs such as seed, seeding and tillage operations,

spray materials and spraying, harvesting, and grain storage and handling. In general, an increase in stubble cropping will increase production costs per cultivated acre.

To estimate the impact increased use of fertilizer and other crop production technology would have on rotation lengths, costs and net returns, a series of farm plans were developed, to represent a few soil zonal and soil productivity situations in the Prairie Provinces. In developing these farm budget plans it was necessary to make a number of assumptions and working rules.

Working Rules and Assumptions

(1) *Soil zones and soil productivity levels*—To recognize the influence that geographic location and quality of soil may have on yields and on farm costs and returns farm budget plans were developed for the Brown, Dark Brown, Black and Grey Wooded Soil Zones. The Black Soil Zone was divided into eastern and western sections, the dividing line being at about the Third Meridian running north and south, approximately at the centre of Saskatchewan, to recognize differences in rainfall and climate and effects on crop yields. Within each of the five zones three broad levels of soil productivity, low, medium and high, were designated.

(2) *Land use*—Wheat is grown throughout the area and is the most important crop, although it is not equally important in all zones. However, to simplify calculations it was assumed that wheat was the only crop grown in all soil and zone situations, irrespective of length of rotation. This is a realistic assumption, in terms of costs and yields for possible alternative crops, but may be less so with respect to limitations imposed by cultural requirements and disease control.

(3) *Length of rotation*—Fallow-seeded crop refers to crop seeded on land which was fallow the previous year. Stubble-seeded crop refers to crop seeded on land which was cropped with grain the previous year. Rotations considered range from a two-year rotation where 50 per cent of the land is fallow and 50 per cent wheat, through a series of steps to a 10-year rotation where 80 per cent of the land is stubble-cropped, 10 per cent is fallow-cropped and only 10 per cent is fallow. Although a continuous cropping system was not considered the 10-year rotation approaches continuous cropping. However, it is felt that in areas where continuous cropping might be feasible there will always be situations, such as need to control persistent weeds, periodic low spring moisture, excessive moisture on poorly drained areas, late springs and

limited time for seeding or reseedling that will tend to push some land into fallow.

(4) *Cultural and tillage practices*.—The levels of cultural and tillage practices used represent those of an average operator using currently accepted practices. Seeding is by drill or discer, which ever practice is followed in each specific area. Herbicides, for control of the common broad leaf weeds, are applied in all areas. Spray for wild oat control is applied in all areas except the low and medium productivity soils of the Brown Soil Zones and low productivity soils in the Dark Brown Zone. All wheat is swathed and combined. The kind of tillage machine and number of tillage operations vary by soil and soil zone (2) (3).

(5) *Fertilizer Use*—The rates of application and formulae were based on recommendations for the respective soil and rotation situation (4) (5) (6). The rates used were of course very generalized.

(6) *Crop Yields*—The first step in determining the most suitable rotation length was to develop estimates of yields under different soil zone, soil productivity level, fertilizer practice, and rotation length situations (Table 1). Rotation experiments, including fertilizer treatments have been conducted in numerous areas but they are for the most part specific to a given and limited number of soil types and phases, and rotation lengths and time period. In addition, the results may include periods in which practices were substantially different from those used now. It is difficult to adjust experimental results to farm situations and particularly so in this study when a single estimate, for example, yields for soils in the Dark Brown Soil Zone, are used to represent a wide range of soil conditions and locations.

The estimated yields in Table 1 were synthesized, with supporting interpretation, judgment and knowledge of experienced agronomists (7) from (a) rotation experiments throughout the area, (b) experience of farmers, and (c) estimates of yields compiled by government sources such as the Dominion Bureau of Statistics and provincial government crop reports, and private sources (8) (9). For cultural situations without the use of fertilizers, yields were based on the 1945-1959 period, with modification to represent use of current practices. The 1945-1959 period reflects to some extent, the influence of mechanization, herbicides, and other technologies on yields, but generally will not reflect the use of fertilizers. For situations with the use of fertilizers, the estimated yields reflect the expected response to general recommendations for fertilizer formulae and rates of application for both fallow and stubble-seeded crop.

TABLE 1—ESTIMATED AVERAGE ANNUAL WHEAT YIELDS ACCORDING TO SOIL ZONE, SOIL PRODUCTIVITY LEVEL, POSITION IN ROTATION, AND FERTILIZER PRACTICE, PRAIRIE PROVINCES

Soil Zone and Rotation Position	Soil Productivity Level					
	Low		Medium		High	
	Without Fertilizer	With Fertilizer	Without Fertilizer	With Fertilizer	Without Fertilizer	With Fertilizer
bushels per acre						
Brown Zone						
Wheat on fallow.....	12.6	—	16.8	20.3	20.7	24.7
Wheat on 1st stubble ^a	6.6	—	10.1	—	13.2	18.2
Wheat on 2nd stubble.....	6.4	—	9.8	—	12.9	17.7
Wheat on 3rd stubble ^b	6.3	—	9.6	—	12.5	17.3
Dark Brown Zone						
Wheat on fallow.....	13.8	—	18.0	22.0	21.9	26.4
Wheat on 1st stubble ^a	7.3	—	11.0	15.5	14.0	19.5
Wheat on 2nd stubble.....	7.1	—	10.7	15.1	13.6	19.0
Wheat on 3rd stubble ^b	6.9	—	10.4	14.7	13.3	18.5
Black Zone (Eastern Section)						
Wheat on fallow.....	18.7	23.2	22.8	27.6	25.6	30.8
Wheat on 1st stubble ^a	11.2	16.0	14.8	19.8	17.1	22.8
Wheat on 2nd stubble.....	10.9	15.6	14.4	19.3	16.7	22.2
Wheat on 3rd stubble ^b	10.6	15.2	14.1	18.8	16.2	21.7
Black Zone (Western Section)						
Wheat on fallow.....	19.0	23.8	23.0	28.0	25.9	31.4
Wheat on 1st stubble ^a	11.5	17.0	15.0	20.5	17.4	23.4
Wheat on 2nd stubble.....	11.2	16.6	14.6	20.0	17.0	22.8
Wheat on 3rd stubble ^b	10.9	16.2	14.2	19.5	16.5	22.2
Grey Wooded Zone						
Wheat on fallow.....	17.3	22.8	20.1	26.1	22.9	29.4
Wheat on 1st stubble.....	10.8	17.8	13.1	20.6	15.4	23.4
Wheat on 2nd stubble.....	10.5	17.4	12.8	20.1	15.0	22.8
Wheat on 3rd stubble ^b	10.3	16.9	12.4	19.6	14.6	22.2

^a Wheat seeded on land which was cropped with wheat the previous year.

^b Wheat seeded on land which was cropped successively with wheat the three previous years. Yields were not reduced below the third stubble level, even though longer rotations were used.

The yields in Table 1 are subject to estimative errors of various kinds. The procedure used formalizes that used by agronomists and agricultural economists in recommending fertilizer use, rotation, land use, and crop selection to farmers.

(7) *Machinery Costs*—In setting up the machinery complement, the kind, type and size of machines included were those that could satisfactorily perform the operations required on medium to medium-large grain farms, that is, those farms from approximately 600 to 1200 cultivated acres in size. Two tractors were included, a large one for plowing, cultivating and discing and a smaller one for such operations as drill seeding, harrowing and spraying. Combines and swathers were self-propelled. A truck is included for hauling grain but there has been no allowance for operation of a family car.

Machinery operating costs include depreciation and interest. When these costs are calculated on a once-over per acre basis for each machine, they make allowance for changing capital investment as machinery requirements increase when stubble-cropping is increased. Costs of fuel, oil, grease and

repairs are based on estimates reported by farm operators in farm organization studies (10).

(8) *Labor Requirements*—A labor cost is included for combining when stubble cropping acreage extends beyond that in the three-year rotation.

(9) *Crop Insurance*—Neither premium costs nor indemnity income from crop insurance programs were included in the farm plans.

(10) *Operating Costs*—Table 2 summarizes the operating costs per cultivated acre for the various soil, rotation, and cultural situations. They include seed, fertilizer, other crop services, gas, oil, repairs, interest and depreciation for machinery, and hired labor where needed. The costs do not include real estate taxes, interest on real estate investment, or an allowance for operator and family labor. Costs are developed at current price levels.

(11) *Wheat Price*—To show the effect of net farm price received on the choice of rotation and on net returns five price levels were used; \$1.35, \$1.50, \$1.65, \$1.80 and \$1.95 per bushel. Freight differences according to location are not shown. The prices then represent an average for all grades and all locations.

TABLE 2— OPERATING COSTS PER CULTIVATED ACRE ACCORDING TO SOIL ZONE, FERTILIZER PRACTICE^a, SOIL PRODUCTIVITY LEVEL, AND LENGTH OF ROTATION, PRAIRIE PROVINCES

Soil Zone and Fertilizer Practice		Soil Product- ivity Level	Length of Rotation in Years					
			2	3	4	6	8	10
dollars per cultivated acre								
Brown Zone								
Without fertilizer.....	Low	4.71	5.61	6.16	6.73	6.97	7.16	
	Medium	5.27	6.21	6.80	7.39	7.64	7.84	
	High	6.14	7.38	8.13	8.90	9.25	9.51	
With fertilizer.....	Low	a	a	a	a	a	a	
	Medium	6.44	7.00	7.39	7.78	7.93	8.07	
	High	7.47	9.81	11.10	12.41	13.03	13.45	
Dark Brown Zone								
Without fertilizer.....	Low	5.20	6.04	6.57	7.10	7.32	7.50	
	Medium	6.07	7.16	7.83	8.52	8.82	9.06	
	High	6.76	7.94	8.66	9.41	9.74	10.00	
With fertilizer.....	Low	a	a	a	a	a	a	
	Medium	7.41	9.57	10.77	11.99	12.55	12.95	
	High	8.26	10.67	12.00	13.35	13.98	14.42	
Black Zone-Eastern Section								
Without fertilizer.....	Low	6.34	7.68	8.47	9.27	9.63	9.90	
	Medium	7.00	8.55	9.46	10.38	10.81	11.10	
	High	7.46	9.05	9.98	10.92	11.34	11.65	
With fertilizer.....	Low	7.73	10.13	11.45	12.78	13.40	13.82	
	Medium	8.53	11.27	12.77	14.28	15.00	15.48	
	High	9.14	12.08	13.66	15.26	16.02	16.53	
Black Zone-Western Section								
Without fertilizer.....	Low	6.74	8.23	9.11	10.01	10.42	10.71	
	Medium	7.19	8.79	9.71	10.66	11.09	11.39	
	High	7.57	9.21	10.16	11.05	11.53	11.87	
With fertilizer.....	Low	8.21	10.56	11.94	13.33	13.98	14.42	
	Medium	8.73	11.54	13.07	14.62	15.34	15.83	
	High	9.28	12.26	13.87	15.50	16.27	16.78	
Grey Wooded Zone								
Without fertilizer.....	Low	6.53	7.63	8.79	9.65	10.04	10.31	
	Medium	6.99	8.56	9.48	10.42	10.84	11.15	
	High	7.36	8.06	9.81	10.86	11.30	11.62	
With fertilizer.....	Low	8.26	10.45	12.11	13.48	14.12	14.54	
	Medium	8.87	11.63	13.14	14.67	15.38	15.87	
	High	9.37	12.32	13.92	15.53	16.29	16.80	

^a Fertilizer use was not considered on low productivity soils of the Brown and Dark Brown Soil Zones.

ANALYTIC RESULTS

Altogether, the farm plans show net returns for five soil zones, three productivity levels within each zone, six rotation lengths, and fertilizer practice with and without fertilizer. Although this represents a substantial number of possibilities, it should be recognized that it still represents an average situation for each of these plans, and applies only for the average yield, operating practices, and costs assumed.

Operating Costs

Operating costs show average annual costs per cultivated acre (Table 2). Individual cost items increase or decrease from plan to plan as rotation lengths change and as cultural practices, equipment, and labor needs change. Tillage costs for fallow land decrease as stubble acreage increases. Fall and pre-seeding tillage and seeding costs increase as stubble cropping increases. Seed cost increases directly with increases in stubble cropping. Fer-

tilizer and herbicide costs relate directly to acreages seeded. Swathing and combining costs per acre decrease somewhat as harvested acres increase.

Certain costs also vary between soil zones and between soils of different productivity. Fallow land in the more arid areas of the Brown Zone receives few tillage operations. On the other hand, in the more humid areas of the Black and Grey Wooded Zones fallow may require six to eight tillage operations for weed control. In the more humid areas too, more fall and pre-seeding tillage is needed to prepare the seed bed for stubble-seeded crops because of heavy stubble. Further, the choice of machine varies with area. In some places certain tillage machines are used that specifically maintain trash cover, while in other places plowing is still a common practice.

Net Returns per Cultivated Acre

This section shows the variation in net returns per cultivated acre for the different soil zones (Table 3), as soil productivity, length of rotation, cultural practice (fertilizer use) and farm price of wheat varies. As used here this measure of farm

income represents a return to land, management and labor of the operator and his family. This return is used to meet all family living costs, medical care, education, recreation, operation of family car, real estate taxes, income tax, an interest allowance on owned land equity, and interest and payment on indebtedness and savings.

Changes in net returns show the feasibility of applying fertilizers without changes in land use, assuming yield differences are due to fertilizer. More important, this measure may be used as a criterion to determine the optimum extent to which stubble cropping can be increased on soils of different productivity; that is, which rotation length is the most suitable, in terms of net returns per cultivated acre for the zone, soil, and price level prevailing.

Brown Soil Zone

The Brown Soil Zone covers the most arid part of Saskatchewan and Alberta. It includes the extensive ranching areas of south-west Saskatchewan and southern Alberta. In this zone wheat is the dominant crop; by and large there is no realistic alternative to wheat. Summerfallow has long been

TABLE 3—NET RETURNS PER CULTIVATED ACRE, ACCORDING TO SOIL PRODUCTIVITY LEVEL, FERTILIZER PRACTICE, LENGTH OF ROTATION, AND FARM PRICE OF WHEAT, BROWN SOIL ZONE, PRAIRIE PROVINCES

Soil Productivity Level and Fertilizer Practice	Wheat Price Per Bushel	Length of Rotation in Years					
		2	3	4	6	8	10
	dollars	dollars per cultivated acre					
Low Productivity Soils ^a							
Without fertilizer.....	1.35	4.37	3.48	2.99	2.43	2.19	2.01
	1.50	5.20	4.29	3.78	3.21	2.94	2.75
	1.65	6.04	5.10	4.57	3.97	3.71	3.50
	1.80	6.87	5.91	5.36	4.74	4.46	4.25
	1.95	7.70	6.72	6.15	5.50	5.21	5.00
Medium Productivity Soils ^b							
Without fertilizer.....	1.35	6.41	6.21	6.10	5.76	5.62	5.50
	1.50	7.55	7.39	7.30	6.98	6.83	6.70
	1.65	8.70	8.57	8.51	8.19	8.05	7.92
	1.80	9.85	9.75	9.72	9.40	9.36	9.10
	1.95	11.00	10.93	10.92	10.61	10.46	10.35
With fertilizer.....	1.35	7.60	7.13	6.69	6.16	5.82	5.74
	1.50	9.00	8.50	8.03	7.46	7.20	7.00
	1.65	10.42	9.87	9.36	8.76	8.48	8.27
	1.90	11.83	11.24	10.70	10.06	9.75	9.53
	1.95	13.24	12.61	12.04	11.35	11.03	10.80
High Productivity Soils							
Without fertilizer.....	1.35	8.17	8.33	8.18	7.83	7.68	7.54
	1.50	9.60	9.87	9.76	9.45	9.29	9.16
	1.65	11.05	11.39	11.34	11.03	10.91	10.79
	1.80	12.49	12.96	12.93	12.66	12.53	12.41
	1.95	13.93	14.51	14.52	14.25	14.13	14.04
With fertilizer.....	1.35	9.54	9.95	9.86	9.59	9.46	9.36
	1.50	11.27	11.95	11.96	11.79	11.70	11.62
	1.65	13.02	13.94	14.07	13.98	13.87	13.87
	1.80	14.76	15.91	16.17	16.17	16.17	16.15
	1.95	16.50	17.93	18.27	18.37	18.41	18.42

^a Fertilizer use was not considered on low productivity soils of this zone.

^b On medium productivity soils of this zone fertilizer was applied on fallow-seeded crop only.

an accepted and useful practice in this zone, although it is recognized as a hazardous practice if precautions are not taken to avoid wind erosion.

The plans developed, and for which net returns are shown in Table 3, recognize that fertilizers are not generally recommended on low productivity soils in the Brown Soil Zone. Plans show use of fertilizer for the medium and high productivity soils. In the Brown Zone farm plans, operating costs vary from a low of \$4.71 per cultivated acre on low productivity soils with a two-year rotation without fertilizer to \$13.45 per acre for a 10-year plan on high productivity soils with all seeded land fertilized. A farmer with 1,000 acres cultivated on medium productivity soils, following a two-year rotation not using fertilizer, and considering a shift to a four-year rotation using fertilizer, would find his per acre costs rising from \$5.27 per acre to \$7.39 per acre, an increase of \$2,120 for his 1,000-acre farm (Table 2). The same farmer looking at the increase in net returns as a result of

making the rotation and cultural practice shift and getting an average of \$1.65 per bushel at the local elevator for his wheat, would find his net returns increase from \$8.70 per acre to \$9.36 per acre, an increase of only \$0.66 per acre or \$660 for a 1,000-acre farm (Table 3).

If this farmer had been located on high productivity soils, and made the shift from a two-year no fertilizer plan to a four-year fertilizer plan he would have increased his costs from \$6.14 per acre to \$11.10 per acre, while increasing his net returns from \$11.05 to \$14.07 per acre, an increase of \$3,020 for his 1,000-acre farm.

Farms on low and medium productivity Brown Zone soils show a definite decrease in net returns when the rotation is extended beyond two years, irrespective of fertilizer use, and wheat price. It can be concluded that farm operators on these soils would follow the two-year rotation. Farms on high productivity soils such as the Sceptre heavy clays, and not using fertilizers would not find any

TABLE 4—NET RETURNS PER CULTIVATED ACRE ACCORDING TO SOIL PRODUCTIVITY LEVEL, FERTILIZER PRACTICE, LENGTH OF ROTATION, AND FARM PRICE OF WHEAT, DARK BROWN SOIL ZONE, PRAIRIE PROVINCES

Soil Productivity Level and Fertilizer Practice	Wheat Price Per Bushel	Length of Rotation in Years					
		2	3	4	6	8	10
	dollars	dollars per cultivated acre					
Low Productivity Soils ^a							
Without fertilizer.....	1.35	4.46	3.90	3.46	2.92	2.69	2.51
	1.50	5.37	4.81	4.35	3.79	3.53	3.34
	1.65	6.29	5.71	5.23	4.65	4.39	4.18
	1.80	7.22	6.62	6.12	5.51	5.24	5.02
	1.95	8.15	7.52	7.01	6.38	6.08	5.86
Medium Productivity Soils							
Without fertilizer.....	1.35	6.42	6.34	6.08	5.67	5.49	5.33
	1.50	7.65	7.64	7.40	7.00	6.81	6.66
	1.65	8.89	8.94	8.72	8.32	8.15	7.99
	1.80	10.13	10.24	10.03	9.65	9.47	9.32
	1.95	11.31	11.54	11.35	10.96	10.89	10.65
With fertilizer.....	1.35	7.78	7.76	7.51	7.04	6.84	6.67
	1.50	9.31	9.48	9.29	8.91	8.73	8.57
	1.65	10.85	11.21	11.10	10.77	10.63	10.48
	1.80	12.39	12.93	10.90	12.63	12.52	12.39
	1.95	13.93	14.66	14.70	14.49	14.41	14.31
High Productivity Soils							
Without fertilizer.....	1.35	8.36	8.67	8.56	8.29	8.18	8.07
	1.50	9.88	10.31	10.24	10.01	9.91	9.80
	1.65	11.42	11.96	11.93	11.73	11.64	11.53
	1.80	12.95	13.60	13.62	13.44	13.37	13.27
	1.95	14.48	15.25	15.30	15.16	15.09	15.01
With fertilizer.....	1.35	9.90	10.44	10.41	10.16	10.05	9.94
	1.50	11.76	12.59	12.68	12.53	12.45	12.36
	1.65	13.63	14.73	14.94	14.89	14.87	14.80
	1.80	15.50	16.88	17.20	17.25	17.27	17.24
	1.95	17.37	19.02	19.47	19.61	19.68	19.68

^a Fertilizer use was not considered on low productivity soils in this zone.

advantage going beyond the three-year rotation when they got \$1.50 or less for wheat. At wheat prices greater than \$1.50 and using fertilizers, highest net returns per cultivated acre are found in the four-year rotations, although the differences are not very large when considered in terms of addition to net income for the farm.

The above discussion represents an average situation. It should be recognized that for the low and medium productivity soils, individual farmers may find fertilizer use profitable, particularly when soil tests and spring moisture reserves suggest fertilizer use is likely to be advantageous.

Dark Brown Soil Zones

The Dark Brown Soil Zone occurs in a belt surrounding the Brown Zone. The Dark Brown soils like the Brown soils, are also found under open grassland, but with better moisture and a heavier cover of vegetation. They are however, still subject to limited and variable rainfall situations. As in the Brown Soil Zone, summerfallow has been used extensively to accumulate moisture for the fallow-seeded crops. Although it might be anticipated that other crops would be significant, wheat is the dominant crop, and few realistic alternatives exist. The combination of fallow and wheat has been the best crop income combination for most of the Dark Brown Zone soils (Table 4).

Fertilizers are not recommended for use on low productivity soils, but are recommended for medium and high productivity soils in this zone. At all wheat price levels and for all rotation lengths, the use of fertilizer has an advantage over non-fertilizer situations. However, when the local price of wheat is \$1.35 per bushel there is no advantage in going beyond the two-year rotation even with the use of fertilizer.

With wheat prices at \$1.50 or more; farmers on the medium soils such as the Weyburn loams of central Saskatchewan, and using fertilizer, would begin to consider the three-year rotation, but they would not likely go beyond this even when wheat was at \$1.95 per bushel. Even though the net return of \$14.70 for the four-year with fertilizer situation, is the highest for any price and rotation.

On high productivity soils, such as the Regina heavy clays of the Regina plains and the Rosetown area of central Saskatchewan, rotations longer than two years become more attractive. Machinery operating costs are higher on these soils than on the low and medium productivity soils of the same zone. Without the use of fertilizer a three-year rotation would show a net return of \$8.67 per cultivated acre with \$1.35 wheat and a return of \$15.25 per acre with \$1.95 wheat. Although the net return

with \$1.95 wheat is highest (\$15.30 per acre) with the four-year rotation it is not sufficiently high to make the longer rotation attractive. When fertilizers are used, a three-year rotation would be most suitable with wheat at \$1.35, \$1.50 and \$1.65 per bushel. With higher prices, a four-year rotation would be most applicable. Net returns per cultivated acre increase from \$10.44 per acre for the three-year fertilized rotation to \$19.47 per acre for a four-year fertilized rotation. Although the highest net returns are at \$19.68 per acre for eight and 10-year rotations it is suggested the shorter four-year rotation will be favored.

Eastern Section of the Black Soil Zone

The black soils are found in the Parkland Prairie section of the grassland region which lies between the open prairie and the forest in all the Prairie Provinces (11) (12). These soils are characterized by darker color and high content of organic matter and nitrogen in the surface horizon. The Black Soils are among the most fertile agricultural soils in the region. Wind erosion represents a problem on low productivity soils of this zone (Table 5).

Chemical fertilizers are recommended for all soils in the Black Zone (4) (6). However, all farm plans were prepared for situations without and with fertilizer. More tillage operations on fallow and in preparation of stubble crop land are performed here than on soils in the Dark Brown Zone, and hence operating costs are higher. Costs range from \$6.34 per acre on a two-year rotation without fertilizer on low productivity soils, to \$16.53 per acre for a 10-year rotation with fertilizer on high productivity soils.

On the low productivity soils net returns for all wheat prices and for all rotation lengths are higher for plans where fertilizers are used than for those without fertilizer, for comparable prices and rotations. However, without the use of fertilizers and even at the highest wheat price, there is no advantage going beyond the two-year rotation. For plans with fertilizer and when prices are at \$1.80 and \$1.95, three-year rotations would be the most favorable.

The high productivity soils of the zone, such as the Newdale Association in Manitoba respond well to fertilizer. At all price levels and for both fertilizer and without fertilizer the minimum rotation is three years. Without use of fertilizers, a three-year rotation would be most suitable at wheat prices of \$1.35 to \$1.80 per bushel. At a wheat price of \$1.95 then a four-year rotation would be most applicable.

TABLE 5—NET RETURNS PER CULTIVATED ACRE ACCORDING TO SOIL PRODUCTIVITY LEVEL, FERTILIZER PRACTICE, LENGTH OF ROTATION, AND FARM PRICE OF WHEAT, EASTERN SECTION BLACK SOIL ZONE, PRAIRIE PROVINCES

Soil Productivity Level and Fertilizer Practice	Wheat Price Per Bushel	Length of Rotation in Years					
		2	3	4	6	8	10
	dollars	dollars per cultivated acre					
Low Productivity Soils							
Without fertilizer.....	1.35	6.62	6.21	5.81	5.26	5.00	4.80
	1.50	7.90	7.57	7.17	6.62	6.36	6.16
	1.65	9.20	8.92	8.53	7.99	7.73	7.53
	1.80	10.49	10.26	9.89	9.35	9.09	8.89
	1.90	11.78	11.61	11.25	10.71	10.45	10.26
With fertilizer.....	1.35	8.27	7.96	7.56	6.97	6.70	6.50
	1.50	9.89	9.77	9.44	8.92	8.67	8.48
	1.65	11.52	11.59	11.32	10.86	10.64	10.47
	1.80	13.15	13.40	13.21	12.80	12.61	12.46
	1.95	14.78	15.21	15.10	14.75	14.58	14.45
Medium Productivity Soils							
Without fertilizer.....	1.35	8.73	8.82	8.60	8.26	8.07	7.95
	1.50	10.32	10.55	10.50	10.09	9.90	9.79
	1.65	11.92	12.28	12.16	11.91	11.75	11.64
	1.80	13.53	14.01	13.94	13.73	13.58	13.49
	1.95	15.12	15.74	15.72	15.55	15.41	15.34
With fertilizer.....	1.35	10.44	10.52	10.25	9.77	9.53	9.36
	1.50	12.39	12.74	12.58	12.20	12.00	11.84
	1.65	14.35	14.96	14.91	14.61	14.47	14.36
	1.80	16.31	17.18	17.25	17.04	16.93	16.83
	1.95	18.27	19.40	19.58	19.45	19.39	19.32
High Productivity Soils							
Without fertilizer.....	1.35	10.16	10.62	10.58	10.28	10.21	10.10
	1.50	11.96	12.60	12.64	12.43	12.34	12.24
	1.65	13.77	14.59	14.69	14.54	14.48	14.39
	1.80	15.58	16.51	16.75	16.64	16.61	16.54
	1.95	17.39	18.56	18.81	18.75	18.74	1
With fertilizer.....	1.35	11.99	12.50	12.43	12.14	12.02	11.89
	1.50	14.18	15.03	15.10	14.95	14.86	14.77
	1.65	16.38	17.56	17.78	17.74	17.72	17.66
	1.80	18.58	20.09	20.45	20.53	20.56	20.55
	1.95	20.78	22.62	23.12	23.33	23.41	23.44

When fertilizers are used, a three-year rotation would be most suitable at wheat prices of \$1.35 to \$1.65 per bushel. At a wheat price of \$1.80 per bushel a four-year rotation would be most suitable. At a wheat price of \$1.95, a four to six-year rotation would be most applicable. Net returns increase from \$12.50 per cultivated acre with the three-year rotation and a wheat price of \$1.35 per bushel to approximately \$23.33 per acre with the four to six-year rotation and a wheat price of \$1.95. As prices go from \$1.65 to \$1.80 per acre, four-year and even six-year rotations are likely to be the ones selected, although the highest net return per acre for the prices used is for a ten-year rotation at \$1.95. This return of \$23.44 per acre is not sufficiently greater than the \$23.33 per acre of the six-year rotation, or even greater than the four-year rotation with a return of \$23.12, to make the longer rotation attractive.

Western Section Black Soil Zone

Although wheat yields and response to fertilizers ascribed to this area are higher than those used in the eastern section of the Black Zone, costs of production are also higher. Fertilizers are recommended for all soils (4) (5). The general picture of net returns for the various plans used is about the same as in the eastern section of this Zone with a few exceptions. Three-year rotations with fertilizer, on low productivity soils become the most favorable ones with wheat prices as low as \$1.50 per bushel. However, without fertilizer the most favorable rotation is still a two-year rotation. On medium productivity soils for plans without fertilizer, if wheat prices are below \$1.65 the two-year rotation has the highest return; at \$1.65 the three-year rotation is barely the best one and at \$1.80 and \$1.90 the three-year rotation is likely to be chosen (Table 6).

TABLE 6—NET RETURNS PER CULTIVATED ACRE ACCORDING TO SOIL PRODUCTIVITY LEVEL, FERTILIZER PRACTICE, LENGTH OF ROTATION, AND FARM PRICE OF WHEAT, WESTERN SECTION BLACK SOIL ZONE, PRAIRIE PROVINCES

Soil Productivity Level and Fertilizer Practice	Wheat Price Per Bushel	Length of Rotation in Years						
		2	3	4	6	8	10	
Low Productivity Soils		dollars	dollars per cultivated acre					
Without fertilizer.....	1.35	6.42	5.95	5.47	4.83	4.57	4.36	
	1.50	7.73	7.32	6.87	6.26	5.96	5.75	
	1.65	9.05	8.70	8.26	7.66	7.37	7.16	
	1.80	10.36	10.07	9.65	9.06	7.77	7.57	
	1.95	11.67	11.45	11.05	10.46	10.18	9.97	
With fertilizer.....	1.35	8.19	8.25	7.94	7.45	7.23	7.06	
	1.50	9.86	10.14	9.92	9.52	9.32	9.17	
	1.65	11.53	12.02	11.91	11.51	11.42	11.29	
	1.80	13.21	13.92	13.89	13.64	13.52	13.41	
	1.95	14.88	15.82	15.87	15.69	15.61	15.53	
Medium Productivity Soils								
Without fertilizer.....	1.35	8.67	8.76	8.55	8.14	7.96	7.80	
	1.50	10.28	10.51	10.35	9.99	9.81	9.65	
	1.65	11.90	12.26	12.16	11.83	11.67	11.51	
	1.80	13.51	14.01	13.96	13.66	13.53	13.38	
	1.95	15.12	15.76	15.76	15.50	15.38	15.24	
With fertilizer.....	1.35	10.51	10.74	10.56	10.18	9.97	9.82	
	1.50	12.49	13.02	12.96	12.69	12.52	12.39	
	1.65	14.48	15.29	15.36	15.19	15.08	14.98	
	1.80	16.47	17.57	17.75	17.69	17.62	17.57	
	1.95	18.46	19.84	20.15	20.20	20.17	20.14	
High Productivity Soils								
Without fertilizer.....	1.35	10.25	10.73	10.70	10.52	10.37	10.25	
	1.50	12.07	12.75	12.79	12.68	12.54	12.43	
	1.65	13.91	14.76	14.88	14.82	14.72	14.61	
	1.80	15.74	16.78	16.98	17.00	16.89	16.80	
	1.95	17.57	18.79	19.07	19.11	19.06	18.99	
With fertilizer.....	1.35	12.26	12.86	12.83	12.54	12.40	12.29	
	1.50	14.49	15.45	15.57	15.41	15.32	15.24	
	1.65	16.73	18.04	18.31	18.27	18.25	18.20	
	1.80	18.98	20.63	21.05	21.13	21.17	21.16	
	1.95	21.23	23.22	23.83	24.00	24.09	24.13	

When farm plans on these medium soils include fertilizer it is only at a wheat price of \$1.35 that a choice would be made between the two or three-year rotation. At prices of \$1.50 and \$1.65 the three-year rotation has the clearest advantage and at \$1.80 and \$1.90, the four-year rotation is likely to prevail. Although the six-year rotation has a net return of \$20.20 per acre it is only five cents per acre or \$50 per 1,000-acre farm higher, which is not likely sufficient to encourage the adoption of the longer rotation.

On the high productivity soils, such as those in the Lacombe-Red Deer area of Alberta, at all price levels and with or without fertilizers a rotation of at least three years in length is likely to be selected. For farm plans with fertilizer use, and \$1.65 and \$1.80 wheat, four-year rotations will be used. At \$1.90 per bushel both the four and six-year rotations become attractive.

Grey Wooded Zone

Soils of the Grey Wooded Zone extend across Manitoba, Saskatchewan and Alberta. It is not a continuous, more or less solid, block as is the case with the Brown and Dark Brown Zones. Despite the wide geographic spread only one series of plans is presented to represent this broad zone. These soils are formed under the influence of more moist conditions than soils of the Black Zone. The natural cover is forest. Organic matter is low and hence soils are lower in natural fertility than the Parkland soils (12). After the land has been cleared and under cultivation for a few years, maintenance of fertility becomes a problem. Mixed farming is more likely than single cropping. Crops grown in this zone respond more favorably to the application of chemical fertilizers than in the other zones. Fertilizers are recommended for all Grey Wooded Zones (4) (13).

TABLE 7—NET RETURNS PER CULTIVATED ACRE, ACCORDING TO SOIL PRODUCTIVITY LEVEL, FERTILIZER PRACTICE, LENGTH OF ROTATION, AND FARM PRICE OF WHEAT, GREY WOODED SOIL ZONE, PRAIRIE PROVINCES

Soil Productivity Level And Fertilizer Practice	Wheat Price Per Bushel	Length of Rotation in Years					
		2	3	4	6	8	10
	dollars	dollars per cultivated acre					
Low Productivity Soils							
Without fertilizer.....	1.35	5.49	5.47	4.75	4.24	4.01	3.85
	1.50	6.65	6.72	6.03	5.44	5.31	5.15
	1.65	7.85	7.98	7.30	6.94	6.62	6.42
	1.80	9.04	9.23	8.58	8.05	7.90	7.76
	1.95	10.23	10.47	9.90	9.42	9.21	9.07
With fertilizer.....	1.35	7.47	8.27	7.97	7.75	7.67	7.59
	1.50	9.06	10.16	9.98	9.87	9.82	9.77
	1.65	10.66	12.04	11.98	11.98	11.98	11.96
	1.80	12.26	13.82	13.99	14.08	14.14	14.15
	1.95	13.86	15.69	16.01	16.19	16.30	16.34
Medium Productivity Soils							
Without fertilizer.....	1.35	6.92	6.83	6.55	6.09	5.88	5.71
	1.50	8.31	8.34	8.11	7.68	7.47	7.31
	1.65	9.70	9.88	9.67	9.26	9.08	8.92
	1.80	11.10	11.36	11.22	10.84	10.67	10.52
	1.95	12.50	12.87	12.77	12.42	12.26	12.13
With fertilizer.....	1.35	9.09	9.84	9.91	9.76	9.71	9.63
	1.50	10.93	12.03	12.25	12.23	12.23	12.19
	1.65	12.77	14.21	14.59	14.70	14.77	14.76
	1.80	14.62	16.40	15.92	17.16	17.29	17.32
	1.95	16.47	18.58	19.25	19.62	19.81	19.89
High Productivity Soils							
Without fertilizer.....	1.35	8.44	9.62	8.69	8.28	8.14	8.01
	1.50	10.04	11.28	10.52	10.16	10.03	9.92
	1.65	11.64	13.14	12.35	12.04	11.94	11.92
	1.80	13.25	14.91	14.17	13.91	13.83	13.74
	1.95	14.68	16.67	16.00	15.89	15.73	15.66
With fertilizer.....	1.35	10.81	11.90	12.11	12.05	12.04	12.00
	1.50	12.90	14.39	14.75	14.88	14.92	14.91
	1.65	15.00	16.88	17.43	17.69	17.82	17.85
	1.80	17.09	19.37	20.10	20.50	20.70	20.78
	1.95	19.18	22.06	22.77	23.32	23.58	23.72

Despite the fertilizer recommendation for the low productivity soils, a two-year rotation would be most suitable at wheat prices of \$1.35 to \$1.80. At \$1.95 per bushel the three-year rotation (net return of \$10.47 per cultivated acre) would be the most suitable. When fertilizers are used a three-year rotation would be most suitable at wheat prices of \$1.35, \$1.50 and \$1.65. At a wheat price of \$1.80 per bushel a three to four-year rotation would be most suitable and at \$1.95 a four to six-year rotation has, if not the absolute highest net return, at least the most likely appeal (Table 7).

On the high productivity soils, when fertilizer is used, with wheat at \$1.35 per bushel a three-year rotation is the most likely. With \$1.50 wheat, the four-year rotation is most likely and at successively higher prices the longer rotations become more attractive as they provide higher net returns per acre of cultivated land. At the highest price levels

used, that is \$1.80 and \$1.95 per bushel, the returns continue to increase to the 10-year rotation. This situation approaches a continuous cropping system and other things being equal, such as ability to control weeds, and carrying out all crop production operations in relatively short seasons, this rotation would begin to have appeal.

OVERALL EVALUATION

The most suitable rotation, without and with use of chemical fertilizers, and according to productivity soil group, soil zone and for each assumed farm wheat price is shown in Table 8.

When the rotation is extended in length beyond two years on low and medium productivity soils of the Brown Zone and the low productivity soils of the Dark Brown Zone, net returns per cultivated acre show a definite decrease below the highest level.

TABLE 8—SUMMARY OF THE MOST SUITABLE ROTATION LENGTH, ACCORDING TO SOIL ZONE, SOIL PRODUCTIVITY LEVEL, FERTILIZER PRACTICE AND FARM PRICE OF WHEAT, PRAIRIE PROVINCES

Soil Zone and Fertilizer Practice	Soil Productivity level	Farm Price of Wheat				
		\$1.35	\$1.50	\$1.65	\$1.80	\$1.95
		length of rotation in years				
Brown Soil Zone						
Without fertilizer.....	Low	2	2	2	2	2
	Medium	2	2	2	2	2
	High	2	3	3	3	3
With fertilizer.....	Low	a	a	a	a	a
	Medium	2	2	2	2	2
	High	3	3	3	4	4
Dark Brown Soil Zone						
Without fertilizer.....	Low	2	2	2	2	2
	Medium	2	2	2	2	2
	High	3	3	3	3	3
With fertilizer.....	Low	a	a	a	a	a
	Medium	2	2	3	3	3
	High	3	3	3	4	4
Black Zone (Eastern Section)						
Without fertilizer.....	Low	2	2	2	2	2
	Medium	2	2	3	3	3
	High	3	3	3	3	4
With fertilizer.....	Low	2	2	2	3	3
	Medium	2	3	3	3	3
	High	3	3	3	4	4-6
Black Zone (Western Section)						
Without fertilizer.....	Low	2	2	2	2	2
	Medium	2	2	3	3	3
	High	3	3	3	3	4
With fertilizer.....	Low	2	3	3	3	3
	Medium	2	3	3	3	4
	High	3	3	4	4	4-6
Grey Wooded Zone						
Without fertilizer.....	Low	2	2	2	2	3
	Medium	2	2	2	3	3
	High	3	3	3	3	3
With fertilizer.....	Low	3	3	3	3-4	4-6
	Medium	3	3	4	4-6	6-8
	High	3	4	6	6-8	6-8

^a Fertilizer use was not considered on low productivity soils of the Brown and Dark Brown Soil Zones.

Therefore it may be assumed that farm operators on these soils would use a two-year rotation.

With the use of fertilizer on the high level soils, net returns may be increased with addition of stubble-seeded crops until a three or four-year rotation is reached and then returns tend to decrease. Conditions of production in the western section of the Black Soil Zone are somewhat more favourable for stubble cropping than in the eastern part and that tends to make longer rotations more favourable, and hence encourages greater use of stubble cropping. However, the greatest shift to stubble cropping is indicated in the Grey Wooded Zone.

On soils where an increase in stubble-cropping may be adopted, all farm operators will not necessarily follow vigorously a predetermined rotation. Instead there will be a tendency to fertilize and seed particular stubble fields whenever spring moisture, absence of certain weeds, and general seeding date indicates such fields could be safely cropped.

Fertilizer use will increase yield of grain on both fallow and stubble-seeded crops, and decrease the yield spread between them. However, it is suggested that the extent to which fallow acreages may be decreased and stubble-seeded acreage increased will

depend on a combination of three factors, first, production costs per cultivated acre that vary with changes in land use; second, yields on stubble-seeded crop in relation to fallow yields, and third, the price of wheat.

Considering an average farm wheat price of \$1.50 to \$1.65 per bushel, the study shows that when yields on stubble-seeded crops are less than 65 per cent of fallow-seeded yields, the two-year rotation will tend to dominate. This situation may be generally anticipated on low and medium productivity soils of the Brown and low productivity soils of the Dark Brown Zones. These are soils on which fertilizer use is not likely and even when used does not provide a return to make a longer rotation more profitable.

When stubble yields amount to 65-74 per cent of fallow yields, then a three-year and a four-year rotation would be most suitable with the three-year rotation dominant. This situation (at \$1.50 and \$1.65 wheat) may be anticipated with use of fertilizer on high productivity soils of the Brown and Dark Brown Zones and low and medium productivity soils of the Black and Grey Wooded Zones. When stubble yields are above 75 per cent of the fallow yields a four-year and possibly longer rotation would be most suitable. This situation might be anticipated on the high productivity soils of the Black and Grey Wooded Zones.

The price of wheat alone will have considerable influence on choice of the rotation. With \$1.35 wheat a three-year rotation would bring the highest net return per cultivated acre on the high productivity soils of the Black and Grey Wooded Soils. With a wheat price of \$1.95 per bushel the rotation could be extended to six or possibly eight years for the best rotation on these highly productive soils.

A general observation of this study indicates, that accepting the yields shown as those most likely attainable, and accepting the costs as representative of current farm operating costs, and in light of the prices received for wheat (14), the general farmer adherence to a two and three-year rotation in the Brown and Dark Brown Zones and three and four-year rotations in the Black and Grey Wooded Zones has been realistic. Although the net returns per cultivated acre may be slightly higher in longer rotations than those specified as most likely, the additional return is small. If the difference in the net returns per cultivated acre is 25 cents between a three-year and a four-year rotation on a 1,000-acre farm it means an increase in net returns of \$250. To shift to a longer rotation would require some rearrangement of labor use in the seeding and following season, possibly different and more

machinery, greater cash outlays for fertilizer, seed, and operating costs, and different harvesting operations. Unless the financial gain as measured by the increase in net returns per cultivated acreage is significant the farmer will be inclined to stay with his present equipment and the cropping system he knows.

Of course, two possibilities exist that could have enough influence to cause a shift to longer rotations. First, an increase in wheat yields as a result of use of more fertilizer and other innovations. But generally these developments come slowly to most farmers. The mere availability of an input, say fertilizer, is not in itself sufficient to cause its use and produce higher yields. The farmer must learn how and what to apply. On the more arid areas of the Brown and Dark Brown Soil Zones, increasing efficiency in the use and timing of the field operations, with the large power and tillage units, in the moisture conservation struggle, may be an effective way of increasing yields with little additional input. The second major factor is price. Given the costs and yields of this study there is little doubt farmers would respond to higher wheat prices by using more fertilizer and more stubble-seeded land to push their rotations over longer periods to get the higher net returns. On the other hand, lower prices would have a tendency to shorten the rotations, and maintain the familiar fallow-wheat rotation of the wheat areas.

This study has not considered the implications of farmers' shifts to more fertilizer and longer rotations on such factors as regional changes in land use, production, producer demand for inputs such as fertilizer and machinery, redistribution of labor use, changes in finance, farm size or farm numbers. Some of these implications will be examined in a following study (15).

NOTES AND REFERENCES

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- (2) B. E. Tonn, *Economic Aspects of Farm Machinery Use in Crop Production in South Central Manitoba, 1964*, Economics Branch, Canada Department of Agriculture, Aug. 1965.
- (3) M. J. Dubois, *Economic Aspects of Farm Machinery Use in Crop Production, Reston-Cromer Area, Manitoba, 1965*, Economics Branch, Canada Department of Agriculture, April 1966.
- (4) *Guide to Farm Practices*, University of Saskatchewan, Saskatchewan Department of Agriculture and Canada Department of Agriculture, 1967.
- (5) *Alberta Farm Guide*, The University of Alberta, The Alberta Department of Agriculture and Canada Department of Agriculture, 1967.
- (6) *Field Crop Recommendations for Manitoba*, Manitoba Department of Agriculture and Conservation, Winnipeg, 1967.

- (7) The assistance of a number of persons at Research Stations of the Canada Department of Agriculture in the Prairie Provinces and at the Department of Soils, University of Saskatchewan, Saskatoon is acknowledged.
- (8) *Wheat Yields by Towns*, Sanford Evans Statistical Service, Winnipeg, Manitoba.
- (9) H. C. Moss. *The Relation Between Type of Soil and Yields of Wheat in Saskatchewan*, No. 2 in Series of Saskatchewan Soils in Relation to their Productivity and Use, Department of Soil Science, University of Saskatchewan, Saskatoon, Jan. 1962.
- (10) "Changes in Farm Organization Studies", conducted in Manitoba, Saskatchewan and Alberta, 1954-1967, Published and Unpublished Material, Economics Branch, Canada Department of Agriculture.
- (11) J. Mitchell, H. C. Moss and J. S. Clayton, *Saskatchewan Soil Survey Report No. 13*, University of Saskatchewan, Saskatoon, Saskatchewan, 1950.
- (12) J. H. Ellis, *Soils of Manitoba*, Economic Survey Board, Winnipeg, Manitoba, Sept. 1938.
- (13) J. A. Toogood, C. F. Bentley, G. R. Webster and A. W. Moore, *Grey Wooded Soils and Their Management*, Faculty of Agriculture, University of Alberta, Edmonton, Alberta, Bul. No. 21, Sept. 1962.
- (14) The average annual price of No. 3 Northern wheat in the 25-cent freight rate zone, of mid-Saskatchewan, for the 10 crop years 1955-56 to 1964-65 was \$1.47. For the last five years of this period it averaged \$1.64 per bushel.
- (15) For a full account of this research project see the publication of the same title, Economics Branch, Canada Department of Agriculture, 1968.

POLICY AND ADMINISTRATION OF PUBLIC LANDS IN SASKATCHEWAN WITH PARTICULAR REFERENCE TO AGRICULTURE (1)

T. F. Joyce

Public land policies in any geographical-political area are largely determined by the physical, economic and institutional framework within which they will operate. During the settlement years in Saskatchewan, the policy was to transfer agricultural lands to private ownership as rapidly as possible. With the transfer of the forest resources of the western provinces from federal to provincial jurisdiction in 1930, the Government of Saskatchewan became responsible for both the public agricultural and non-agricultural lands. Thereafter the determination of policy with respect to public lands and their administration in Saskatchewan has been divided between the Department of Agriculture and the Department of Natural Resources. The Department of Agriculture controls all provincial lands suitable for agriculture and the Department of Natural Resources directs the use of lands in forested areas, provincial parks and protected areas. Their present policies emphasize programs of development, management and conservation. A common objective is to use the proprietary and spending powers of the government for attaining the highest and best use of public lands; thereby to improve the economic and social welfare of the people.

Provincial lands represent over half the area of Saskatchewan. Of the total area of 251,700 square miles, 138,432 are controlled by the Province (Table 1). Forest preserves and provincial parks amount to 121,751 square miles. There are 16,681 square miles of land classed as "other", the major portion of which is agricultural. Altogether provincial lands occupy 55 per cent of the surface area of the Province. In contrast, federal lands amount to 8,381 square miles or 3.3 per cent of the total area and are mostly in national parks, Indian reservations and Prairie Farm Rehabilitation Administration community pastures.

The data in Table 1 show that 52 per cent of Saskatchewan is forested and 45.6 per cent is in agricultural use. The remainder of the land, 2.4 per cent, is classified as "other". This includes urban land, road allowances, grass and brush land and all waste land such as open muskeg, swamps, and rock. The agricultural lands are found in the southern part of the province and the productive and non-productive forested lands lie mostly to the north.

TABLE 1—TOTAL LAND AND WATER AREA OF SASKATCHEWAN CLASSIFIED BY TENURE AND USE

	Square Miles	Per cent
Total land Area.....	220,182	87.5
Total Fresh Water Area.....	31,518	12.5
Total Area of Province.....	251,700	100.0
Tenure (circa) 1965		
Federal Lands		
National Parks.....	1,496	0.6
Indian Reserves.....	1,913	0.7
Other.....	4,972	2.0
Total.....	8,381	3.3
Provincial Lands		
Provincial Parks.....	1,803	0.7
Forest Reserves.....	119,948	47.7
Other.....	16,681	6.6
Total.....	138,432	55.0
Privately owned land or land in process of alienation from the Crown	104,887	41.7
Total Area of Province.....	251,700	100.0
Use in 1962:		
Occupied Agricultural Land		
Improved.....	67,372	30.5
Unimproved.....	33,278	15.1
Total.....	100,650	45.6
Forested		
Productive.....	46,809	21.3
Non-productive.....	67,499	30.7
Total.....	114,308	52.0
Other.....	5,224	2.4
Total Land Area.....	220,182	100.0

Source: *Canada Year Book* 1967, pages 7, 34, and 441.

THE DEPARTMENT OF AGRICULTURE

Lands Branch

Under the authority of the Provincial Lands Act and the Agricultural Development and Adjustment Act, provincial agricultural lands are administered by the Department of Agriculture. As of March 31, 1967, 8,738,346 acres were under the jurisdiction of the Department through its Lands Branch. In regard to provincial land, the principal functions of this Branch are: operation of community pastures, improvement of land, appraisal of land, disposition of land, acquisition of land and project research. In organization it has a Community Pastures and Land

Use Division, a Field Services Division, a Land Disposition Division, a Land Posting Committee and an Appeal Board.

The Community Pastures and Land Use Division is responsible for the management and development of community pastures. It researches, assesses and plans projects for improved land use in low productivity areas, then selects, acquires and reserves the appropriate acreage. These activities entail close co-operation with other government agencies. For approved A.R.D.A., P.F.R.A., co-operative and other provincial projects, this Division arranges the necessary land purchase, exchange or transfer. Expropriation is not a usual practice. As a special assignment the Division acquires land needed to implement the South Saskatchewan River Irrigation Project.

About 6 million acres of public lands were under cultivation, grazing and hay permits or leases in 1967 to some 14,000 farmers. When land becomes available for leasing, the Posting Committee, comprised of Divisional supervisors of the Lands Branch, decides upon its disposition according to its suitability for cultivation, grazing, hay or other purposes. Land is withheld if it is unsuitable for agriculture or if a decision is made to reserve it for special purposes. Posted land is allocated to the applicant with the highest number of points under a rating system for the following factors, ability as a farmer and farm manager; capital resources of applicant; need for land; proximity of land to farm headquarters; and war services. Unsuccessful applicants may appeal to the Appeal Board. Cash rental rates for cultivation leases are 6 per cent of the appraised land value in a normal crop year and less in a poor crop year. Grazing rental varies according to the carrying capacity of the land and the price of cattle. Leases may not be assigned without permission.

Control over the utilization and improvement of leased land is exercised by the Lands Branch. On cultivation leases good husbandry is required and only designated land may be broken for crops. On pasture land authorization must be obtained before the lessee may seed land to grass or legume. Grazing leases designate stocking capacities to guard against overgrazing. All pastures must, however, be fully utilized. Lands Branch representatives may make inspections to ensure that lessees comply with the provisions of their leases.

The Lands Branch has a program to help finance the clearing and breaking of approved leased land. Where clearing and breaking costs exceed \$12.50 an acre and permission has been obtained, a cash repayment is made to the lessee or his contractor.

The maximum amount that may be approved is \$30 an acre.

Nine new farming areas have been opened in northern Saskatchewan by the government clearing and breaking about 40 per cent of the acreage on each of the farm units. They were then leased for 10 years with the lessee having the option of purchasing after 5 years. Although farms in these areas may vary in size and soil, at the time of allocation they were considered to be economic units; that is, they were believed to provide the operator with a standard of living considered to be reasonable and appropriate in the particular localities.

Since 1965, the government has promoted the sale of land under cultivation and small grazing leases and this has been the main reason for alienation of title. Such land, however, is available only to the lessee on an optional basis and while the lease is in effect. All land to be sold is appraised. The appraisal is based on Soil Survey Reports No. 12 (2) and No. 13 (3) and soil ratings as established by the Rural Land Assessment Manual (4). The price of cultivated or arable land is determined by converting the soil rating to a monetary value. Grazing land is placed in a productivity class according to its estimated carrying capacity and then is converted to a monetary value. The selling price of provincial land is related to market value by using the land price trend of the previous year as based on studies made by the Department of Agriculture.

Conservation and Development Branch

Under the Conservation and Development Act, conservation and development areas are established in order to save, conserve and develop any land and water resource on an organized area basis. They are primarily related to the water development of drainage basins. There is no limit in size of these areas. They presently range from 1,500 to 481,000 acres. The initiative usually comes from farmers in the district. Area authorities consist of three or more local people and each authority is a body corporate. They receive direct aid in planning, financing, constructing and maintaining projects. Continuing administrative and technical support is available. The assistance is provided through the Conservation and Development Branch which undertakes a considerable amount of the actual construction of necessary works.

Among other duties of the Conservation and Development Branch are the construction and development of community pastures by clearing and breaking, seeding perennial forage and erecting

fences. The water development program of this Branch includes the investigation, planning and construction of flood control and irrigation works in new areas. In older areas there is a continuing program of renovation and reconstruction of existing works. A special project of this Branch is the survey and construction of the distribution and drainage system for the South Saskatchewan River Irrigation Project Program.

Agricultural and Rural Development Act

In the conservation and development of agricultural resources, the Department of Agriculture maintains close co-operation and co-ordination with A.R.D.A. To facilitate this liaison, the Department has a Director of Agricultural Rehabilitation and Development Act Programs. A Joint Advisory Committee with federal and provincial representation reviews projects, programs and plans for mutual acceptability in principle. There is also an A.R.D.A. Co-ordinating Committee comprised of deputy-ministers of departments having an interest in A.R.D.A. projects. Agricultural cost-sharing A.R.D.A. agreements include provincial and co-operative community pastures, soil and water, irrigation, drainage and erosion projects as well as research and rural development projects. One project, the location of ground-water supplies, shows reserves of billions of gallons. There are special programs with A.R.D.A. for Indians and Metis. A.R.D.A. pays the full costs of the Canada Land Inventory and those projects considered to be in the national interest such as the recent Socio-Economic Study of Census District 16, a low-income agricultural area.

Community Pastures

The province has an extensive system of community pastures and their numbers and acreage continue to increase. In addition to the P.F.R.A. pastures there are provincial pastures, co-operative association pastures and municipal pastures. Altogether in March 1967 there were 2,879,630 acres of public lands in community pastures. The greatest number of acres was in the P.F.R.A. community pastures. Of the total of 1,719,296 acres in these pastures, 1,260,538 represented land transferred by the province to Canada for pasture purposes and 458,758 acres represented land leased to Canada. There were 571,890 acres in provincial and A.R.D.A. pastures, 569,389 acres in co-operative association pastures and 19,055 acres in municipal pastures. On all community pastures the Lands Branch estimated that there were 189,893 adult cattle owned by 10,229 farmer patrons. A recent trend is the establishment of sheep pastures. These are part of the government

program to encourage sheep production in Saskatchewan. In 1968 there will be grazing available in five provincial sheep pastures for 16,000 ewes and lambs.

Farm Enlargement and Consolidation

The main assistance and impetus for farm enlargement and consolidation in Saskatchewan comes from the operations of the federal Farm Credit Corporation. The province however, does support and encourage the formation of more economic farm units through extensification or intensification. In the allocation of cultivation and pasture lessees, a preference may be given to the enlargement of small farm units. Mention has been made of financial encouragement for lessees to clear and break approved land. There is also a 50-50 cost-sharing agreement with A.R.D.A. by which farmers in rural development areas of the province may qualify for a subsidy of \$3 an acre for clearing land. Reference was made to the practice of placing farmers on economic units when new areas in northern Saskatchewan are opened for settlement. In the land redistribution involved in implementing the development of the South Saskatchewan River Irrigation Project, care is taken to locate farmers on economic units. A three-quarter section farm under typical management with 300 good irrigable acres is considered to be an economic unit.

Saskatchewan has a Family Farm Credit Act that provides assistance to farmers to establish and develop family farms as economic farm units. The designated agency that may make loans is the Co-operative Trust Company and the maximum amount available to any one borrower is \$25,000. Under a half-cost shareable agreement with A.R.D.A. valid until 1970, submitted but not yet approved, the province is proposing the expenditure of \$682,500 for farm consolidation purposes. This would be a voluntary program for the purchase of uneconomic farm units when offered for sale in three small pilot areas with consolidation to take place by long term lease or "first option to purchase" by remaining farm units.

THE DEPARTMENT OF NATURAL RESOURCES

The Department of Natural Resources administers policies and programs affecting the non-agricultural lands of Saskatchewan. The Provincial Lands Act is the legal basis for the authority of the Department of Natural Resources as well as the Department of Agriculture. These departments have a Co-ordinating Land Use Committee. Through it any land that has changed its agricultural or forest status is by agreement or Order-in-Council passed from one department to the other. Some agricultural use

is made of those forest lands which adjoin settled land and which afford hay and pasture. In these areas hay and pasture permits are issued by the Department of Natural Resources on a yearly basis.

The Department of Natural Resources administers the Crown Timber and Preservation of Forest Land Act (The Forest Act). This Act designates all lands that lie within provincial forests. The Department also administers the Provincial Parks and Protected Areas Act that applies to any provincial land considered suitable for recreational purposes. If additional land is required, it can be bought or expropriated.

The Resources Division of the Department is responsible for formulating policies and implementing programs for the renewable natural resources of fish, forest and wildlife. The organization of the Division includes a Fisheries Branch, a Forestry Branch and a Wildlife Branch. A major administrative problem arises in the resolving of competing demands upon the same resource by conflicting interests such as those of recreational and commercial users; also, in some areas, it is necessary to give consideration to the claims of the local people who are mostly Indians and Metis. In order to attain the most efficient use of the resources entrusted to their care, these Branches give top priority to programs of resource research, inventory, conservation, development and management. For administrative purposes the Resource Division divides the province into a Southern Region, a Central Region and the Hudson Bay Region. In addition there is a Northern Region under the authority of the Northern Affairs Division of the Department. Its programs emphasize the use of resources for the benefit of the natives.

The Recreation Division has jurisdiction over provincial parks, regional parks, picnic sites, camp

numbers continue to increase as does the amount of acreage involved. At present about 2,000,000 acres are controlled for recreational purposes, some of which is agricultural land. Land may be purchased, accepted as a gift, exchanged or expropriated. The Division has well organized programs of parks development and historic sites preservation. It has six branches—Regional Parks, Park Planning, Park Operations, Historic Sites, Construction and Resource Lands.

The Resource Lands Branch provides land administration guidance to other branches of the Department of Natural Resources. It undertakes all land acquisition and arranges for land sales, exchanges, transfers and leases. Permits are issued sites and historic sites. These are located throughout the province, excepting the northern region. Their for timber, hay and pasture use. It has departmental responsibility for liaison with A.R.D.A. ranging from the submission of projects, programs and plans for approval to the administration of both shareable and non-shareable projects that are authorized. The largest of these is the current Capability Studies for Forestry, Fisheries, Wildlife and Recreation under the Canada Land Inventory.

NOTES AND REFERENCES

- (1) This article is mainly based on annual reports of the Saskatchewan Department of Agriculture and the Saskatchewan Department of Natural Resources. It has been reviewed by officials of these Departments.
- (2) Mitchell, J., et al, *Soil Survey Report No. 12*. University of Saskatchewan, Saskatoon, Sask., June 1944.
- (3) Mitchell, J., et al, *Saskatchewan Soil Survey Report No. 13*. University of Saskatchewan, Saskatoon, Sask., 1950.
- (4) Freeman, T. H., Thompson, W. E., Chappell, C. H., *The Saskatchewan Rural Land Assessment System*, Minister of Municipal Affairs, Government of Saskatchewan, Regina, Sask., 1950. Second Edition.

POLICY AND PROGRAM DEVELOPMENTS

Potato Price Stabilization Order—The Agricultural Stabilization Board was authorized, for the purpose of stabilizing the price of potatoes at the prescribed price, to make payment for the benefit of producers of potatoes on the basis of eligible acres of potatoes grown in 1967. Payments shall be made subject to such terms and conditions as the Board may prescribe and shall be \$12.50 for each one-half eligible acre or part thereof. (June 5, 1968)

Lamb and Wool Support Programs—The programs for the 12-month period ending March 31, 1969, provide a support price of \$18.80 per 100 pounds, national liveweight basis, for lamb and a price of 60 cents a pound for wool of eligible grades. The lamb program applies to Choice and Good grades in a carcass weight range from 35 to 56 pounds. A wool producer, to be eligible for deficiency payment under the 1968-69 program must market at least 20 pounds of wool of eligible grades through a registered wool warehouse during the year. (June 7, 1968)

Sugar Beet Support Program—Sugar beets will be supported, through deficiency payments, from September 1, 1968 to August 31, 1969 at a prescribed

price of \$15.98 per standard ton (250 pounds of sugar) delivered to the processing plant. (June 7, 1968)

Long Term Loans for Fur Farmers—Through an amendment to the Farm Credit Act regulations the definition of farming has been expanded to include the raising of fur bearing animals, and thus making fur farmers eligible for loans from the Farm Credit Corporation. (June 21, 1968)

Canadian Dairy Commission 1968-69 Quota Policy—The Commission increased individual quotas effective April 1, 1968, for small and medium volume manufacturing milk and cream shippers who exceeded their quotas in 1967-68. This is in keeping with its policy of using available quotas to help such producers develop more economic units. About 37,000 farmers will benefit. Farmers who had quotas in 1967-68 but made no deliveries will not have a quota in 1968-69. The Commission gave notice that quotas cannot be provided to people entering the manufacturing milk or cream field after April 1, 1968 except where a new shipper has purchased the herd of an existing quota holder. (June 17, 1968)

PUBLICATIONS

ECONOMICS BRANCH PUBLICATIONS

The Structure of the Canadian Manufacturing Milk and Cream Industry, White, W. J. and Heighton, V. A., Economics Branch, Canada Department of Agriculture, Ottawa, March 1968. Pub. No. 68/6, pp. vi + 68.

The report is based on the results of a mail survey conducted by the Economics Branch, Canada Department of Agriculture and discusses the nature, direction and causes of adjustments which have taken place and those which are in process in the manufacturing milk and cream industry.

The Economics of Beef Production, Furniss, I. F. and Yorgason, V. W., Economics Branch, Canada Department of Agriculture, Publication 1356, Ottawa 1968. pp. 33.

Discussed in this publication are the various aspects of beef production and consumption in Canada including livestock numbers, and marketing channels.

UNITED NATIONS PUBLICATIONS

Available in Canada from the Queen's Printer

Agrarian Reconstruction, Basic Study No. 18, Jacoby, Erick H., Food and Agriculture Organization of the United Nations, Rome, 1968. pp. x+82. Price: U.S. \$1.25.

Agrarian reconstruction is the subject of this publication. It includes as its basic element the planning and implementation of land reform, with its complementary programs in the fields of credit, extension, cooperation and marketing, which together are designed to change the traditional framework of agriculture and facilitate the transition from a subsistence to a market economy.

Fisheries in the Food Economy, Basic Study No. 19, Food and Agricultural Organization of the United Nations, Rome, 1968. pp. xi+79. Price: U.S. \$1.25.

This report discusses the place of fisheries in the world economy and in nutrition. Various aspects of fish production, utilization and trade as well as factors influencing future supply and demand for fish and fishery products are discussed in this report.

OTHER PUBLICATIONS

Not available from Economics Branch

Canadian Journal of Agricultural Economics, Vol. 16, No. 2, June 1968. Published three times a year by the Canadian Agricultural Economics Society. Copies available from the Society at Box 632, Postal Station B, Ottawa 4, Ontario, Canada. Single copies \$3.75. Annual subscription: \$7.50.

Contents of the June 1968 issue include the following articles by members of the Society:

Marketing Boards and Quota Policies for Canadian Farm Products: An Appraisal of Performance

Aggregating Competitive Behavior in the Food Industry.

Cooperative Institutions: The Wide and the Narrow. The Futures' Market and Farm Programs.

Farm Financial Management: Emerging Problems.

Dynamic Programming: A Tool for Farm Firm Growth Research.

A Computer Managerial Package for Feed Mills.

Measuring Management Performance of Dairy Farmers.

Projecting Canadian Dairy Farm Structure Using Markov Processes.

Canadian Wheat Acreage Response.

Predicting Wheat Acreage in the Prairie Provinces. Some Economic Aspects of Pest Control in Agriculture.

An Economic Evaluation of Non-Resident Hunting and Guiding in the East Kootenay.

Negative Taxation and Rural Poverty.

1966 Alberta Crop Enterprise Analysis, Krause, L. G., Farm Management Branch, Economic Division, Alberta Department of Agriculture, 1968. Publication No. 821/100-1. pp. 46.

This report is the first detailed enterprise analysis that has been done on crop production, from data contributed by participants in the Farm Business Analysis Program offered by the Economics Division of the Alberta Department of Agriculture.

Sheep Production in Ontario, Commercial Enterprises, Costs, Returns and Management, Stephens, John R., Farm Economics, Cooperatives and Statistics Branch, Ontario Department of Agriculture and Food, April 1968. pp. 30.

This report is the result of the cooperation with the Branch of a large number of commercial sheep operators throughout Ontario. Valuable information is provided concerning production and management practices, costs and returns of the sheep enterprises.

STATISTICAL APPENDIX

AVERAGE PRICES OF SELECTED CANADIAN FARM COMMODITIES, VARIOUS MARKETS AND GRADES, 1967-1968

Commodity, grade and market	1967			1968			
	Average	May	June	Mar.	Apr.	May	June
CATTLE (weighted average prices at public stockyards)							
	dollars per cwt.						
Good slaughter steers							
Toronto.....	27.65	26.48	27.40	25.55	25.50	26.17	27.19
Winnipeg.....	26.60	25.40	26.45	24.62	25.31	26.48	27.31
Calgary.....	26.05	24.64	25.71	24.24	24.33	25.48	26.84
Good feeder steers							
Toronto.....	28.70	28.19	29.49	27.84	29.00	29.45	30.00
Winnipeg.....	26.55	26.63	27.81	26.01	26.00	27.37	28.20
Calgary.....	26.40	26.22	26.35	25.19	25.70	26.65	27.29
Good and choice veal calves							
Toronto.....	36.15	38.87	38.08	38.39	37.78	37.63	37.20
Winnipeg.....	38.85	39.69	39.42	38.66	39.96	40.49	39.99
Edmonton.....	30.40	36.76	35.91	31.63	33.18	33.37	35.85
HOGS (weighted average prices at public stockyards, Grade A dressed)							
Toronto.....	30.70	32.52	32.38	27.97	26.98	28.27	30.81
Winnipeg.....	28.55	30.33	29.97	26.33	25.49	26.65	28.82
Calgary.....	27.05	28.88	27.93	24.97	23.83	24.06	26.10
LAMBS (weighted average prices at public stockyards, Good lambs)							
Toronto.....	26.65	31.47	36.61	30.17	32.16	43.22	37.28
Winnipeg.....	21.40	23.05	29.38	23.50	24.98	28.16	34.21
Calgary.....	20.40	22.80	24.62	22.29	25.27	27.77	28.38
FLUID MILK (f.o.b. factory)							
Halifax.....	6.24	6.10	6.10	6.45	6.45	6.45	6.45
Montreal.....	5.96	6.00	6.00	6.00	6.00	6.00	6.00
Toronto.....	5.98	6.10	6.10	6.15	6.15	6.15	6.15
Winnipeg.....	5.84	5.97	5.97	5.97	5.97	5.97	5.97
Vancouver.....	6.93	6.77	6.92	7.22	7.25	6.88	6.89
MANUFACTURING MILK (average farm value) ^{a, d}							
Nova Scotia.....	3.22	3.10	3.29	3.20	3.19	—	—
New Brunswick.....	3.12	2.98	3.14	3.26	3.17	—	—
Quebec ^b	3.32	3.30	3.32	3.38	3.31	—	—
Ontario ^c	3.28	3.29	3.28	3.34	3.29	—	—
British Columbia.....	3.27	3.31	3.28	3.26	3.17	—	—
BUTTERFAT (for butter, average farm value) ^{a, e}							
Prince Edward Island.....	67.7	67.0	67.5	68.0	68.0	—	—
Quebec ^b	64.8	65.5	65.5	65.5	65.5	—	—
Ontario ^c	61.3	61.6	61.6	61.8	61.8	—	—
Saskatchewan.....	62.5	63.0	62.3	62.5	62.5	—	—
British Columbia.....	—	—	—	—	—	—	—
EGGS (average paying prices at registered grading stations, Grade A Large)							
	cents per doz.						
Halifax.....	36.3	30.4	28.0	33.5	33.4	31.2	29.7
St. Anselme.....	35.5	32.2	29.9	31.6	32.0	31.2	29.7
London.....	33.4	29.6	28.0	30.4	30.9	28.8	27.6
Winnipeg.....	26.9	24.6	22.0	24.1	25.0	23.1	23.2
Vancouver.....	30.2	29.2	26.5	34.4	34.7	32.5	35.0
BROILERS (average prices paid to growers No. 1 grade chicken under 5 lbs.)							
	cents per lb. live						
Toronto.....	19.6	19.6	19.0	20.1	20.8	21.0	21.1
Edmonton.....	21.0	21.5	20.9	21.5	21.5	22.0	22.0
TURKEYS (average prices paid to growers, No. 1 grade, 12-20 lbs.)							
London.....	23.7	22.9	23.0	23.0	23.4	23.5	23.5
Edmonton.....	25.4	—	—	—	—	—	—

AVERAGE PRICES OF SELECTED CANADIAN FARM COMMODITIES, VARIOUS MARKETS AND GRADES,
1967-1968 (Concluded)

Commodity, grade and market	1966-67	1967		1968			
	Crop Year Average	May	June	Mar.	Apr.	May	June
POTATOES (Can. No. 1 Table, average prices to growers)							
		dollars per cwt.					
Prince Edward Island.....	1.21	1.07	1.02	1.23	1.30	2.17	2.18
New Brunswick.....	1.00	0.73	0.85	0.95	0.77	1.40	1.77
Southwestern Ontario.....	1.70	1.30	1.37	1.87	1.75	1.68	1.93
EASTERN GRAINS							
		cents & eights per bu.					
Oats (Ont. No. 2 White, f.o.b. shipping points)	82/2	78	78	85	85	85	85
Barley (Ont. good malting, f.o.b. shipping points).....	145	145	145	137	137	134/4	137
Corn (Ont. No. 2 Yellow, f.o.b. Chatham, 15% moisture, in carlots).....	152/6	143	147/6	127	126	123/5	126/4
Soybeans (Ont. No. 2, f.o.b. Chatham).....	306/6	321/5	339/7	276/3	272/1	272/1	269/2
WESTERN GRAINS (basis in store Fort William/Port Arthur, less freight and elevator handling charges)							
Red Spring Wheat (No. 2 Nor.)							
Winnipeg.....	195/6	196/6	195	180/2	180	179/3	180/7
Regina and Edmonton.....	192/2	193/2	191/4	176/6	176/4	175/7	177/3
Durum Wheat (No. 1 C.W.A.D.)							
Winnipeg.....	213	210/6	209/5	189/2	188/4	186/6	192/7
Regina and Edmonton.....	209/4	207/2	206/1	185/6	185	183/2	189/3
Feed Wheat							
Winnipeg.....	177/3	178/6	177/5	165/2	165	164/3	165/7
Regina and Edmonton.....	173/7	175/2	174/1	161/6	161/4	160/7	162/3
Oats (No. 1 feed)							
Winnipeg.....	79/4	78/7	79/5	82/1	82/6	82/5	82/2
Regina.....	77/4	76/7	77/5	80/1	80/6	80/5	80/2
Edmonton.....	75/4	74/7	75/5	78/1	78/6	78/5	78/2
Barley (No. 1 feed)							
Winnipeg.....	117/1	112/6	114/5	112	112/2	106/4	104
Regina.....	114/1	109/7	111/6	109/1	109/3	103/5	101/1
Edmonton.....	111/2	107	108/7	106/2	106/4	100/6	98/2
Rye (No. 2 C.W.)							
Winnipeg.....	125/2	129/6	126/6	130/5	126/1	120/1	113/6
Regina.....	121/6	126/3	123/3	124/2	119/6	116/6	110/3
Edmonton.....	118/5	123/1	120/1	124	119/4	113/4	107/1
Flaxseed (No. 1 C.W.)							
Winnipeg.....	291/3	288/3	296	333/3	322/4	344/6	339/4
Regina.....	288/1	285/1	292/6	330/1	319/2	341/4	336/2
Edmonton.....	284/5	281/5	289/2	326/5	315/6	338	332/6
Rapeseed (No. 1 C.W. basis in store Vancouver)	278/1	273	269/2	224	213/5	212/7	211

^a Since the average farm values for manufacturing milk and butterfat published by the Dominion Bureau of Statistics (D.B.S.) do not include the Federal subsidies, it is necessary to add, during the 12 months' period ended March 31, 1968, the Federal payment of \$1.21 per 100 pounds of milk testing 3.5% butterfat, of which 11 cents were retained for export aid. The net payment was made directly to producers at the equivalent rate of 31.42 cents per pound of butterfat. Similarly for 1968-69, \$1.31 (less 15 cents) per 100 pounds should be added to manufacturing milk and 37.42 cents per pound (less 1 cent) to butterfat. The 1967 yearly average figure excludes the Federal payment of 85 cents per 100 pounds (less 7.3 cents for export assistance) for the January-March period.

^b The 1967 yearly average farm values for manufacturing milk and butterfat to producers in the Province of Quebec exclude a subsidy payment of 10 cents a pound butterfat, made by the Quebec Government, for the January-March period. The policy was terminated on March 31, 1967.

^c The 1967 yearly average farm values to producers in the Province of Ontario exclude a payment, made by the Ontario Government, for the January-March period of 25 cents a 100 pounds of manufacturing milk and secondary and excess fluid milk delivered to plants, basis 3.5% butterfat. For all cream grading Special and No. 1, the payment was 10 cents a pound butterfat.

^d Beginning January 1, 1968, a new D.B.S. series for the average farm value of manufacturing milk includes all milk used for manufacturing purposes. Milk used for the manufacture of butter was previously excluded. Comparable figures are shown for 1967.

^e Beginning January 1, 1968, a new D.B.S. series shows the price of butterfat in cream for manufacturing into butter (farm-separated cream) and is not comparable with the previously published series for butterfat, which included the butterfat in milk used for manufacturing into butter. Comparable figures are shown for 1967.

VOLUME 3 NUMBER 4

OCTOBER 1968

CANADIAN FARM ECONOMICS

Trends in Production and Utilization of Milk Solids- Not-Fat and Butterfat.....	H. J. Mestern and V. McCormick	1
An Analysis of World Wheat Exports by Types of Wheat.....	G. A. Hiscocks	6
Farm Credit Reviewed.....	R. S. Rust	13
National Farm Products Marketing Legislation and Organization....	J. D. F. Kidd and G. A. Hiscocks	18
Starting Position and Pattern of Development of Starting Farming in the Rosetown - Elrose Area of Saskatchewan.....	R. G. Wiens	22
Policy and Program Developments.....		28
Publications.....		28
Statistical Appendix.....		29

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CANADIAN FARM ECONOMICS

TRENDS IN PRODUCTION AND UTILIZATION OF MILK SOLIDS-NOT-FAT AND BUTTERFAT

H. J. Mestern and V. McCormick

Interest in the composition of milk and products which are made from milk, has in recent years, increased in Canada and in other countries.

In Canada, cow's milk consists, on the average, of 12 per cent milk solids and 88 per cent water. The milk solids are made up of about 3.5 per cent butterfat and 8.5 per cent solids-not-fat. One or more of the major milk components are used in a number of statistical summaries of milk production and utilization. The most common procedure is to state milk production in terms of pounds of milk produced and to describe consumption and exports in terms of pounds of product.

It has been customary to convert manufactured dairy products to a milk equivalent basis⁽¹⁾. This provides for a consolidation of consumption and export figures in terms of one common denominator—the milk equivalent. A unit of milk equivalent, in Canada, is generally understood to be 100 pounds of raw cow's milk containing 3.5 per cent butterfat. In most other dairy producing countries, except the United States, a different unit of volume is used and the butterfat standard usually varies according to the national average butterfat test.

Statistics on milk consumption in terms of milk equivalent do not adequately reflect the consumption of dairy products which contain little or no butterfat. For this reason, it has been a practice in the United States for many years to record consumption of milk and dairy products not only in terms of actual product weight and milk equivalent but also in terms of total milk solids—butterfat and solids-not-fat. International agencies, such as the Organization for Economic Co-operation and Development (O.E.C.D.) are now requesting member countries to submit dairy statistics in terms of butterfat and solids-not-fat.

A new statistical series, starting in 1964, was developed by the Dominion Bureau of Statistics which shows reported commercial sales of milk and cream in Canada by various classes not previously segregated. This gives a new yardstick by which to measure more accurately the solids-not-fat and the fat content of reported commercial sales of fluid milk and cream products.

This paper presents a summary of Canadian milk production and consumption in terms of solids-not-fat and butterfat, separately and combined, for the four-year period, 1964-67, for which detailed product data are available (2).

CORRECTIONS

Volume 3, Number 3, August 1968

- (1) Page 2, table 2, line 1, Commercial stocks at August 1, 1966-67, should read 5,751.
- (2) Page 4, left column, paragraph 2, line 2, should read "... in 1967, shipments totaling 95 million pounds ..." and page 4, table 2, headings should read "Cheese", "Skim Milk Powder", "Whole Milk Powder", "Casein" "Butter and Butter Oil". Units are "thousand pounds".
- (3) Page 6, right column, last paragraph, first line should read "Acreage in 1968 is expected to be down ...".
- (4) Page 31, left column, last paragraph, should read "The Recreation Division has jurisdiction over provincial parks, regional parks, picnic sites, camp sites and historic sites. These are located throughout the province, excepting the northern region. Their numbers continue to increase ..." and page 31, right column, paragraph 2, lines 6 and 7 should be omitted.

FLUID MILK PRODUCTS

Changes in the demand for milk solids have resulted in divergent trends in the consumption of solids-not-fat and butterfat in fluid products. In recent years, there has been a pronounced change in the consumer preference for products with a lower butterfat content than the normal amount found in standard milk (about 3.5 per cent butterfat). Sales of partly skimmed milk (2 per cent butterfat) have been increasing in volume, while those of standard and special milks have been on the decrease. The result has been a general upward trend in the total con-

TABLE 1—DOMESTIC CONSUMPTION OF SOLIDS-NOT-FAT AND BUTTERFAT IN FLUID MILK AND CREAM PRODUCTS^a, CANADA, 1964 TO 1967

	1964	1965	1966	1967
	thousand pounds			
Solids-not-fat				
Standard milk.....	291,368	291,050	284,830	276,704
Special milk.....	1,699	1,446	1,081	874
Partly skimmed (2%) milk.....	50,822	60,673	73,310	86,398
Skim, buttermilk and chocolate.....	28,619	29,170	28,461	26,657
Cereal cream.....	7,962	8,343	8,540	8,740
Table cream.....	1,537	1,396	1,225	1,134
Whipping cream.....	1,393	1,406	1,317	1,323
Sour cream.....	512	542	554	610
Total reported commercial sales.....	383,912	394,026	399,318	402,440
Butterfat				
Standard milk.....	113,310	113,186	110,767	107,607
Special milk.....	850	723	541	437
Partly skimmed (2%) milk.....	11,294	13,483	16,291	19,199
Skim, buttermilk and chocolate.....	2,352	2,413	2,381	2,257
Cereal cream.....	11,678	12,236	12,525	12,818
Table cream.....	3,953	3,590	3,149	2,915
Whipping cream.....	8,103	8,183	7,662	7,700
Sour cream.....	1,317	1,394	1,426	1,570
Total reported commercial sales.....	152,857	155,208	154,742	154,503

^a Reported Commercial sales only.

sumption of solids-not-fat while the consumption of butterfat has remained unchanged (Table 1).

The solids-not-fat in total reported commercial fluid milk sales increased from 384 million pounds in 1964 to 402 million pounds in 1967 (Table 1), representing a rise of 4.2 per cent during the period, but on a per capita basis a slight decrease occurred. The butterfat in reported commercial milk sales increased slightly from 153 million pounds in 1964 to 154.5 million pounds in 1967, but declined on a per capita basis.

The term "reported" sales of milk and cream represents quantities which are reported monthly by fluid processing plants to the Dominion Bureau of Statistics. Besides these reported sales, considerable quantities of milk are sold directly to consumers by farmers (3). A characteristic of fluid milk statistics is that the figures for production and consumption are identical.

MANUFACTURED DAIRY PRODUCTS

The divergent trends in the consumption of solids-not-fat and butterfat in manufactured dairy products have been evident over the last 25 years. The per capita consumption of creamery butter, for example, declined from a high of 27.2 pounds in 1942 to 16.4 pounds in 1967. By contrast, the consumption of skim milk powder increased from 2.3 pounds per capita to 6.8 pounds during the same period. (Per capita consumption reached a peak of 8.4 pounds in 1961 and since then has fluctuated).

A complete picture of production and disposition of manufactured dairy products would include

inventory stocks at the beginning of the year, production and imports, which constitute the total supply, less consumption and exports, giving stocks at the end of the year. In the following discussion on manufactured products, only production and domestic consumption are discussed.

The quantity of solids-not-fat which was utilized in the production of manufactured dairy products rose from 423 million pounds in 1964 to 542 million pounds in 1967, an increase of 28 per cent. This increase was due to the large increase in the production of skim milk powder, as a result of the change in farmers' deliveries to the plants from farm-separated cream to whole milk.

Total domestic consumption of solids-not-fat in 1967 amounted to 354 million pounds, only 11 million pounds more than in 1964. Domestic use of skim milk powder fluctuated widely during 1966 and 1967, which partly explains the lack of any appreciable rise in total consumption of solids-not-fat from 1964 to 1967. However, the gap between production and domestic consumption of solids-not-fat in skim milk powder widened from 48 million pounds in 1964 to 170 million pounds in 1967 (Table 2).

The largest market of the Canadian dairy industry for butterfat is still creamery butter, which accounted for about 70 per cent of the 392 million pounds of butterfat consumed in manufactured products in 1967. Consumption of butterfat in manufactured products is declining with the downtrend in butter consumption. The quantity of butterfat used in the production of manufactured dairy products decreased slightly during the four-year period (Table 3).

TABLE 2—SOLIDS-NOT-FAT IN MANUFACTURED DAIRY PRODUCTS, PRODUCTION AND DOMESTIC CONSUMPTION, CANADA, 1964 TO 1967

Product	1964	1965	1966	1967
thousands pounds				
Production				
Butter (creamery, whey, farm).....	3,612	3,458	3,422	3,382
Cheddar cheese.....	44,840	49,007	52,125	50,003
Other cheese.....	5,542	6,735	8,520	9,556
Cottage cheese.....	5,106	5,293	5,530	5,691
Evaporated whole milk.....	56,962	56,135	56,055	52,147
Partly skimmed evaporated.....	3,714	3,103	2,901	2,414
Condensed milk.....	3,524	3,850	4,558	4,767
Whole milk powder.....	15,631	15,363	5,412	5,846
Other whole milk products.....	3,256	2,957	2,388	1,864
Skim milk powder.....	195,940	214,380	254,285	305,305
Evaporated and condensed skim milk.....	2,364	2,443	2,942	3,351
Powdered buttermilk.....	8,669	8,135	8,119	9,348
Casein.....	18,135	20,838	21,996	14,269
Whey powder.....	31,586	40,125	40,701	38,412
Other milk by-products.....	8,006	10,171	9,889	10,503
Ice cream mix ^a	16,367	17,946	21,264	24,592
Total production.....	423,254	459,939	500,107	541,450
Domestic Consumption				
Butter (creamery, whey, farm).....	3,667	3,645	3,561	3,444
Cheddar cheese.....	35,207	37,010	36,353	39,627
Other cheese.....	10,277	11,713	13,091	15,718
Cottage cheese.....	5,106	5,293	5,530	5,691
Evaporated whole milk.....	54,761	54,234	54,294	52,458
Condensed milk.....	3,517	3,828	4,470	4,865
Whole milk powder.....	2,083	2,688	909	3,279
Other whole milk products.....	6,939	6,198	5,351	4,343
Skim milk powder.....	148,037	134,031	157,913	135,002
Evaporated and condensed skim milk.....	2,352	2,460	2,934	3,319
Powdered buttermilk.....	9,218	7,868	7,642	9,069
Casein.....	7,613	5,278	6,242	8,276
Whey powder.....	29,739	38,870	41,602	33,692
Other milk by-products.....	8,006	10,171	9,889	10,503
Ice cream mix ^a	16,367	17,946	21,264	24,592
Total consumption.....	342,889	341,233	371,045	353,878

^a Excludes butter used in the manufacture of ice cream mix.

TABLE 3—BUTTERFAT IN MANUFACTURED DAIRY PRODUCTS, PRODUCTION AND DOMESTIC CONSUMPTION, CANADA, 1964 TO 1967

Product	1964	1965	1966	1967
thousand pounds				
Production				
Butter (creamery, whey, farm).....	293,537	280,085	277,182	273,914
Cheddar cheese.....	49,179	53,750	57,170	54,842
Other cheese.....	5,196	6,314	7,987	8,959
Cottage cheese.....	1,002	1,058	1,088	1,126
Evaporated whole milk.....	24,547	24,191	24,156	22,472
Partly skimmed evaporated.....	730	605	566	471
Condensed milk.....	1,410	1,540	1,823	1,907
Whole milk powder.....	6,029	5,926	2,088	2,258
Other whole milk products.....	934	877	763	558
Powdered buttermilk and whey ^a	661	637	637	713
Ice cream mix ^b	17,147	18,802	22,278	25,764
Total manufactured products.....	399,372	393,785	395,738	392,984
Domestic Consumption				
Butter (creamery, whey, farm).....	297,093	295,257	288,449	279,001
Cheddar cheese.....	38,614	40,591	39,871	43,462
Other cheese.....	9,635	10,981	12,273	14,736
Cottage cheese.....	1,002	1,058	1,088	1,126
Evaporated whole milk.....	23,599	23,371	23,398	22,606
Condensed milk.....	1,407	1,531	1,788	1,946
Whole milk powder.....	804	1,037	350	1,265
Other whole milk products.....	1,745	1,570	1,368	1,050
Powdered buttermilk and whey ^a	694	616	607	689
Ice cream ^b	17,147	18,802	22,278	25,764
Total manufactured products.....	391,740	394,814	391,470	391,645

^a Includes other milk by-products.

^b Excludes butter used in the manufacture of ice cream mix.

TABLE 4—TOTAL DOMESTIC CONSUMPTION OF SOLIDS-NOT-FAT AND BUTTERFAT IN MILK, CANADA, 1964 TO 1967

	1964	1965	1966	1967	Change from 1964 to 1967
	thousand pounds				per cent
Solids-not-fat					
Fluid sales (reported).....	383,912	394,026	399,318	402,440	
Unreported sales.....	50,709	48,625	48,585	45,598	
Consumed in farm homes.....	83,272	79,137	76,491	76,244	
Total fluid.....	517,893	521,788	524,394	524,282	+1.20
Manufactured products.....	342,889	341,233	371,045	353,878	+3.10
Total fluid and manufactured.....	860,782	863,021	895,439	878,160	+2.00
Butterfat					
Fluid sales (reported).....	152,857	155,208	154,742	154,503	
Unreported sales.....	19,720	18,910	18,894	17,733	
Consumed in farm homes.....	32,383	30,776	29,746	29,651	
Total fluid.....	204,960	204,894	203,382	201,887	-0.50
Manufactured products.....	391,740	394,814	391,470	391,645	-0.03
Total fluid and manufactured.....	596,700	599,708	594,852	593,532	-0.50

SUMMARY—TOTAL MILK SOLIDS

The foregoing statistics do not include the consumption of milk used on farms. Farm home consumption of milk is on a downtrend as the number of farmers keeping milk cows is gradually declining. Similarly, direct sales of milk by producers to consumers are steadily diminishing. If these two categories—farm home consumed and direct sales—are combined with consumption of factory products, the level of Canadian utilization of butterfat and solids-not-fat is raised (Table 4). Statistics on milk fed to livestock were not considered in this study.

The trend in consumption of solids-not-fat over

the period 1964 to 1967 was upward, while butterfat consumption trended downward. These trends reflect the changing pattern in consumers' food habits. In 1967, about 60 per cent of the Canadian consumption of milk solids-not-fat occurred in the form of fluid milk products and the market is expanding. On the other hand, 66 per cent of the Canadian market for butterfat is in the manufactured products sector, and this market is gradually shrinking.

A summary of the production and consumption of total solids, butterfat and solids-not-fat, shows an increase in factory output which is far from being matched by Canadian consumption. In the four-

TABLE 5—MILK SOLIDS IN ALL DAIRY PRODUCTS SOLD OFF FARMS PRODUCTION^a AND DOMESTIC CONSUMPTION, CANADA, 1964 TO 1967

	1964	1965	1966	1967	Change from 1964 to 1967
	thousand pounds				per cent
Milk Solids-not-fat					
Production ^a	857,875	902,590	948,010	989,488	+ 5.3
Domestic consumption ^b	777,510	783,884	818,948	801,916	+ 3.1
Surplus.....	80,365	118,706	129,062	187,572	+133.4
Butterfat					
Production ^a	571,949	567,903	569,374	565,220	- 0.1
Domestic consumption ^b	564,317	568,932	565,106	563,881	- 0.1
Surplus (or deficit).....	7,632	(1,029)	4,268	1,339	- 82.5
Total Milk S.N.F. and B.F. Combined					
Production ^a	1,429,824	1,470,493	1,517,384	1,554,708	+ 8.7
Domestic consumption ^b	1,341,827	1,352,816	1,384,054	1,365,797	+ 1.7
Surplus.....	87,997	117,677	133,330	188,911	+114.7

^a In fluid sales (reported and unreported) and manufactured products (factory output).

^b Excludes farm-home consumed in fluid milk.

year period 1964-67 the gap has widened and the total milk solids which were produced in surplus to domestic requirements have more than doubled (Table 5).

This tremendous increase in surplus of factory production of milk solids is in the surplus of solids-not-fat, principally in skim milk powder. Since butterfat and solids-not-fat are produced together in a closely related ratio, an analysis which includes solids-not-fat adds a new dimension to the demand and supply picture which previously was dominated by milk equivalents based on butterfat alone.

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- (1) *Weights and Conversion Factors for Canadian Agricultural Products*, Publication 1155, Canada Department of Agriculture, September, 1962.
- (2) *Apparent Per Capita Domestic Disappearance of Food in Canada, 1966*, Catalogue No. 32-226, November, 1967, Dominion Bureau of Statistics and *Conversion Factors for Individual Dairy Products for Content of Butterfat and Solids-Not-Fat*, unpublished data, Canada Department of Agriculture and Dominion Bureau of Statistics.
- (3) National estimates of unreported sales are based on changes in fluid milk marketing areas and on census surveys of milk sold off farms. Also, milk consumed by farmers themselves is estimated on the basis of a monthly survey.

AN ANALYSIS OF WORLD WHEAT EXPORTS BY TYPES OF WHEAT

G. A. Hiscocks

The object of this article is to study the trends in world trade of different types of wheat and the changes in the composition of world trade in terms of types of wheat exported to different destinations during the period 1956-57 to 1966-67. With a few exceptions in certain years, there were ample supplies of wheat available for export of all the types of wheat analyzed and thus the results are a good indication of the various demands for the different wheats.

World trade in wheat and flour has risen in the past two decades from an average of about 25 million metric tons during the years 1949-50 to 1953-54 to more than 62 million metric tons in 1965-66. In 1966-67, total world trade decreased to 55 million tons. From the same years 1949-50 to 1953-54, Canada's exports rose from an 8 million ton average to a peak of almost 15 million tons in 1965-66 and 1966-67, but has fallen since then (Table 1). During the five-year period 1949-50 to 1953-54, Canada's share of world trade in wheat and flour averaged 31 per cent. Even though exports rose by 25 per cent to average 10.2 million tons between 1959-60 and 1963-64, Canada's share fell to 22.5 per cent as exports by other countries rose much faster. During this five-year period, Australia, France, U.S.A. and U.S.S.R. each increased its share of the market. During the most recent four years, including 1967-68, Canada, with a higher level of exports, improved her share of total trade, to a high of 26.7 per cent in 1966-67 and an average just short of 25 per cent.

The markets to which wheat and flour are exported are many and they vary in their year-to-year demands. There are, however, some general patterns of trade and a useful basis of analysis is to subdivide world exports between the three major groups of Developed Countries, Communist Countries and Developing Countries. This is a fairly common breakdown for world trade analyses, but it has been adjusted to exclude Argentina, Australia, Canada and the United States as wheat exporters which do not import. The Developed Countries comprise the United Kingdom, the six members of the European Economic Community, the rest of Western Europe from Spain in the South to Finland in the North-East, Japan, South Africa and New Zealand. The Communist Countries are the U.S.S.R., the countries of Eastern Europe, Mainland China, Cuba, North Korea and North Vietnam. The Developing Countries make up the rest of the world, i.e., Africa except South Africa, Central and South America except Argentina, Near East and Far East, Asia including India and Pakistan but excluding Japan and Communist Asia.

A breakdown of the exports to the countries in each of these groups is given in Table 2 (the figures are based on reports of exports to these countries and not on imports as reported by them). Exports to the developed countries have changed little over the last 20 years. In the developing countries, there has been a rapid increase from an average of less than 10

TABLE 1—WORLD EXPORTS OF WHEAT AND FLOUR AND SHARE OF WORLD EXPORTS BY MAJOR EXPORTERS

	Average 1949-50 to 1953-54	Average 1959-60 to 1963-64	1964-65	1965-66	1966-67	Forecast ^a 1967-68
million metric tons; wheat equivalent						
Australia.....	2.8	5.4	6.5	5.7	7.2	6.5
Canada.....	8.0	10.2	11.8	14.8	14.7	12.0
France.....	0.7	2.2	4.6	4.8	2.9	3.5
U.S.A.....	9.3	18.4	19.6	23.4	20.2	20.0
U.S.S.R.....	0.9	4.5	1.2	2.2	3.3	4.3
Argentina.....	2.0	2.2	4.4	8.0	3.3	2.6
Others.....	1.8	2.5	2.9	3.4	3.4	—
Total.....	25.5	45.4	51.0	62.3	55.0	52.0
per cent						
Australia.....	11.0	11.9	12.8	9.2	13.1	12.5
Canada.....	31.4	22.5	23.1	23.8	26.7	23.1
France.....	2.7	4.9	9.0	7.7	5.3	6.7
U.S.A.....	36.5	40.4	38.4	37.5	36.7	38.5
U.S.S.R.....	3.5	9.9	2.4	3.5	6.0	8.3
Argentina.....	7.8	4.9	8.6	12.8	6.0	5.0
Others.....	7.1	5.5	5.7	5.5	6.2	5.9
Total.....	100.0	100.0	100.0	100.0	100.0	100.0

^a As forecast at November 1967.

Source: Annual Review of World Wheat Situation and World Wheat Statistics, International Wheat Council.

TABLE 2—DESTINATION OF WORLD EXPORTS OF WHEAT AND FLOUR ACCORDING TO ECONOMIC GROUPINGS

	Average 1949-50 to 1953-54	Average 1959-60 to 1963-64	1962-63	1963-64	1964-65	1965-66	1966-67
million metric tons; wheat equivalent							
Developed Countries.....	16.0	16.6	14.8	16.2	15.5	17.0	16.4
Developing Countries.....	9.4	18.3	18.7	19.1	22.9	23.9	25.2
Communist Countries.....	0.1	10.5	10.1	21.1	12.6	21.4	13.4
Total.....	25.5	45.4	43.6	56.4	51.0	62.3	55.0

million tons to a peak of 25 million tons. For the communist countries, the rise has been even greater from almost nothing to a peak of 21.5 million tons in 1965-66, but with a fairly rapid falling away in 1966-67 and 1967-68.

TYPES OF WHEAT IN WORLD EXPORTS

The principal cultivated wheat (*triticum vulgare*) is divided into three types on the basis of suitability for baking and bread-making. Hard wheat, providing a "strong" flour, rich in gluten and other proteins needed to give bread a satisfactory volume and texture, can be grown only in countries having a hot and fairly dry growing season. It is the principal type of wheat grown in Canada and the United States, and is grown to some extent in Argentina, U.S.S.R. and Australia. This wheat can be spring or winter sown and it is useful to classify it accordingly. Most of the Argentine production and some Russian wheats are classed as medium hard or "filler" wheats. Soft wheat is generally low in protein and yields a "weak" flour, which is suitable for biscuits and cakes but has insufficient baking strength for good quality bread (under modern bakery conditions) without the addition of a proportion of strong flour. Most wheat grown in Western Europe is of this type. Most Australian wheat is also soft but averages better than Western European. The United States and Eastern Canada also grow some good quality soft wheats.

The only other wheat of economic importance is *triticum durum*, a very hard type particularly suitable for the manufacture of semolina from which the many pasta products are made such as spaghetti and macaroni. This wheat is grown in regions with a hot, dry growing season, often on the low-rainfall margin of wheat cultivation. It is the principal type grown

in North Africa, Turkey, other Mediterranean countries and, to some extent, in Italy, France and Spain. It forms a relatively small proportion of production in Canada, United States and Argentina but these three countries provide most of the exportable supplies.

It has not been possible to divide all exports into these different types as they are not shown separately in the statistics of many countries. On the basis of information that is available, trade in wheat has been divided into five major types in the following way:—

1. Durum wheat of Canada and the United States.
2. Hard Spring wheat of Canada (Manitoba Northern) and the Northern United States (Dark Northern Springs).
3. Hard Winter wheat of the United States.
4. Medium Hard wheat of Argentina (Argentine durum has not been separated out) and the U.S.S.R.
5. Soft wheat of all other countries, including Australian, Canadian Eastern, U.S. Soft Red, EEC and Swedish. This group may include small quantities of North African durum and Medium Hard wheat from Australia and Mexico.

Statistics on world trade by wheat type are scarce and the breakdown as listed above was designed to make the best use of available data (1). More data would probably allow refinements in the analysis but it is believed that they would not significantly alter the patterns and trends.

Although it is feasible to analyze the statistics of trade by types of wheat, it is impossible to do this with any meaningful result by type of flour. Thus it is necessary to reduce the export data to wheat grain only. Before doing so, however, it is relevant to consider some of the features of the world exports of flour (Table 3).

TABLE 3—WORLD EXPORTS OF FLOUR BY ECONOMIC GROUPINGS

	Average 1950-51 to 52-53	Average 1960-61 to 62-63	1965-66	1966-67
million metric tons; wheat equivalent				
Developed Countries.....	1.3	1.1	0.7	0.6
Developing Countries.....	3.2	4.2	4.2	4.7
Communist Countries.....	—	0.3	0.6	0.1
Total.....	4.2	5.6	5.5	5.4

Total trade in flour has increased little in the last 16 years and certainly at a much slower rate than trade in wheat. Trade to the developed countries has declined and the only consistent expansion has been to the developing countries. An increasing proportion of this trade has been made up of flour under U.S. aid programs. At the same time, Canada's share has declined because other exporters, particularly France, Germany and Italy have entered the flour market with large volumes of lower-priced flours, often on the basis of large export subsidies.

Developed Countries

Exports of each type of wheat to the developed countries vary from year to year with supplies, quality and prices in exporting countries and demand in the importing country which itself is generally a function of the size and quality of the domestic production. In spite of these annual variations, the data for the 11-year period show some trends (Table 4). Durum imports are reasonably stable although the analysis has not been precise enough to bring

TABLE 4—WHEAT EXPORTS BY TYPE OF WHEAT AND ECONOMIC GROUPINGS

	Durum	Hard Springs	Hard Winters	Medium Hard	Soft	Total
million metric tons						
Developed Countries						
1956-57.....	.91	7.61	3.12	2.11	3.56	17.32
1957-58.....	.77	7.03	1.34	1.79	2.64	13.57
1958-59.....	.69	6.25	1.37	2.34	3.04	13.69
1959-60.....	.73	5.61	1.05	1.71	2.63	11.74
1960-61.....	1.23	6.05	2.96	1.98	3.61	15.83
1961-62.....	.50	5.57	2.88	2.24	5.99	17.18
1962-63.....	.63	4.72	1.46	2.14	4.27	13.22
1963-64.....	.57	5.90	2.35	0.67	6.04	15.53
1964-65.....	.60	4.64	1.72	2.10	5.12	14.18
1965-66.....	1.12	5.18	4.01	1.37	4.98	16.66
1966-67.....	1.28	5.18	2.98	1.17	4.86	15.47
Developing Countries						
1956-57.....	.16	3.31	1.84	2.07	1.93	9.30
1957-58.....	.13	3.20	2.56	1.35	1.56	8.80
1958-59.....	.03	3.07	3.81	2.15	1.21	10.26
1959-60.....	.07	4.26	4.40	1.23	2.82	12.79
1960-61.....	.11	4.69	5.81	1.17	3.41	15.19
1961-62.....	.12	1.14	7.46	1.34	4.59	14.65
1962-63.....	—	1.39	7.51	1.57	4.02	14.49
1963-64.....	.05	1.60	8.84	1.05	3.84	15.38
1964-65.....	—	1.47	10.32	1.75	5.76	19.30
1965-66.....	.25	3.11	10.42	2.21	4.75	20.74
1966-67.....	.46	4.77	5.20	2.51	7.96	20.90
Communist Countries						
1956-57.....	.01	.26	—	3.16	.02	3.44
1957-58.....	—	.44	.11	3.08	.51	4.14
1958-59.....	.03	.32	.10	4.10	.15	4.70
1959-60.....	—	.13	.44	4.37	.32	5.26
1960-61.....	.02	.81	.71	3.11	.48	5.12
1961-62.....	—	2.56	.44	3.51	2.21	8.72
1962-63.....	—	2.13	.36	3.43	3.99	9.91
1963-64.....	.81	7.41	1.67	2.33	7.06	19.28
1964-65.....	.53	3.32	.02	1.74	5.52	11.13
1965-66.....	.47	7.30	—	6.57	6.39	20.73
1966-67.....	.26	5.37	1.37	2.90	3.84	13.74
Total Exports						
1956-57.....	1.07	11.18	4.96	7.34	5.51	30.06
1957-58.....	.90	10.68	4.02	6.22	4.70	26.51
1958-59.....	.75	9.64	5.28	8.60	4.40	28.66
1959-60.....	.80	10.00	5.89	7.32	5.77	29.78
1960-61.....	1.35	11.54	9.48	6.26	7.50	36.14
1961-62.....	.62	9.27	10.78	7.09	12.80	40.56
1962-63.....	.63	8.24	9.33	7.14	12.30	37.64
1963-64.....	1.43	14.90	12.87	4.06	16.92	50.18
1964-65.....	1.13	9.41	12.06	5.58	16.40	44.58
1965-66.....	1.84	15.59	14.44	10.15	16.10	58.12
1966-67.....	2.00	15.33	8.32	6.58	16.54	48.77

together all the exports of durum from the smaller countries, especially those from North Africa.

In the case of Hard Springs, there is a definite declining trend, while for Soft wheat there is an increasing trend. For Hard Winters and Medium Hard, the figures fluctuate considerably but together show less variability in all but three of the ten years. These were also years of high imports of all wheat.

Developing Countries

While there has been a rapid increase in exports of wheat to developing countries, most of the increase has taken place with Hard Winters and Soft wheat (Table 4). Durum and Medium Hard have shown little change and for part of the period, Hard Spring shows a decline. The reason for the big increase in exports of Hard Winters to developing countries is that this was the wheat the U.S. had in surplus and was provided under P.L.480. In many cases, developing countries would have preferred other types of wheat—India, for example, would probably have purchased more Soft Red than Hard Winters with U.S. P.L.480 funds, if sufficient Soft Red had been available. In many of these countries, wheat is not used for the production of factory or bakery bread as eaten in the western world, but is consumed in various other forms, such as unleavened bread, chapati, noodles and steamed wheat. Western style bread is produced in the major cities and its production and consumption will probably increase, but in many cases, particularly where the developing country has some wheat production of its own (many tropical countries cannot grow wheat), they do not want the large proportions of Hard Springs as do several European countries.

During 1966-67, the last year in the analysis, supplies of Hard Winters were low and exports of all other types to developing countries increased. The biggest increase, however, was for Soft wheats which during the long period showed the greatest increase.

Communist Countries

The growth in total trade to these countries has been irregular, with peaks in 1963-64 and 1965-66 and a tendency to decline thereafter (Table 4). As the U.S. has not been a major supplier to most of these countries, there has been only a little growth in Hard Winters. The Medium Hard wheat trade includes the exports of the U.S.S.R. to the Eastern European countries and recently the U.S.S.R. supplies for export have fluctuated considerably. Hard Springs and Soft wheats have filled the gap. In addition, exports to Mainland China have risen since 1961 to about 5 million tons a year, with Soft, Hard Spring and Medium Hard wheats in order of importance. The prime concern of Mainland China is to obtain large quantities of wheat at reasonably low prices, and Canada and Australia, and to a lesser extent, France and Argentina, have been in a position to provide such supplies.

Total Trade

Data showing trade in wheat by types are given in Table 4 and the percentage share in Table 5. It should be noted that the figures for total exports of wheat do not agree exactly with the figures in the earlier tables if flour is subtracted from the wheat and flour in Table 1. This arises because of the method used to obtain the exports of wheat by types and destination, from the major exporting countries. For Canada, the figures were obtained from the annual "Canadian Grain Exports" published by the Board of Grain Commissioners where the data are on an August/July year; the International Wheat Council statistics shown in Tables 1 to 3 are for a July/June year. The data on the United States wheat exports are in "Grain Market News" in July of each year, but the information is based on "Inspections for export" which do not always correspond with

TABLE 5—PERCENTAGE DISTRIBUTION OF TOTAL EXPORTS BY TYPES OF WHEAT

	Durum	Hard Springs	Hard Winters	Medium Hard	Soft	Total
	per cent					
1956-57.....	4	37	17	24	18	100
1957-58.....	4	40	15	23	18	100
1958-59.....	3	34	18	30	15	100
1959-60.....	3	34	20	24	19	100
1960-61.....	4	32	26	17	21	100
1961-62.....	2	23	27	17	31	100
1962-63.....	2	22	25	19	32	100
1963-64.....	3	29	26	8	34	100
1964-65.....	2	21	27	13	37	100
1965-66.....	3	27	25	17	28	100
1966-67.....	4	31	17	14	34	100

TABLE 6—FOOD AND FEED USE OF WHEAT IN DEVELOPED COUNTRIES

	Food Use			Feed Use		
	Average 1955-56 to 1959-60	Average 1960-61 to 1964-65	1966-67	Average 1955-56 to 1959-60	Average 1960-61 to 1964-65	1966-67
thousand metric tons; wheat equivalent						
EEC.....	19,938	20,072	19,650	3,831	4,927	5,450
UK.....	5,700	5,589	5,480	1,852	1,959	1,800
Spain.....	3,827	3,999	3,500	—	—	—
Other Western Europe.....	8,102	9,005	9,590	982	1,016	1,350
Japan.....	2,967	3,294	4,025	265	619	542
South Africa.....	855	907	1,121	—	—	—
New Zealand.....	239	270	293	—	—	—
Total.....	41,628	43,136	43,659	6,930	8,521	9,142

Source: Annual Review of World Wheat Situation, International Wheat Council.

shipments. For all other exports, statistics of the International Wheat Council have been used on the July/June year basis. When analyzed, these data from different sources show only small discrepancies.

Trade in Durum wheat has fluctuated widely due largely to the varying yields of crops in some of the Mediterranean countries where pasta products form a large part of wheat consumption. Some trade in Durum wheat has had to be included with Soft wheat, but if the figures had been adjusted, total trade in this type would probably be about a half million tons higher in most years (2). The general trends and fluctuations would still follow the pattern given in Table 4.

Exports of Hard Spring wheat have also risen from 1956-57 at about 11 million tons to more than 15 million tons in 1966-67. During the period, the trade has fluctuated considerably, only in part due to lack of supplies from exporters. Exports to developed countries form the only sector which has been relatively stable.

Trade in Hard Winters has shown similar trends but with a much higher peak followed by a decline due to some extent to shortage of supplies. The big increase has been due to the requirements of the developing countries and the food aid programs of the United States. Medium Hard wheat exports have fluctuated less than other wheats and, except in the peak trade year of 1965-66, have shown a tendency to decline. Some of the biggest increases occurred in the trade of Soft wheats. Although a peak was reached in 1963-64, the trade has continued at high levels.

Wheat for Feed in Developed Countries

In the developed countries, the use of wheat for human food has been increasing slowly, with sharp rises in Japan offsetting declines in Western Europe (Table 6). However, increasing quantities of wheat, particularly from domestic production, are used for livestock feed (Table 6) and with the expected

TABLE 7—UNITED STATES WHEAT EXPORTS UNDER PROGRAMS^a

	Durum	Hard Red Spring	Hard Winter	Soft Red	White	Mixed	Total
million metric tons							
Developed Countries							
1963-64.....	—	.13	.49	.06	—	—	.68
1964-65.....	—	.02	.59	.88	—	—	1.49
1965-66.....	—	.08	1.26	.15	—	—	1.49
1966-67.....	—	.01	.20	.07	—	—	.28
Developing Countries							
1963-64.....	—	.30	8.35	.11	.17	.01	10.49
1964-65.....	—	.06	9.98	.37	1.78	.02	12.22
1965-66.....	.07	.95	9.84	.36	1.63	—	12.84
1966-67.....	.12	1.93	4.21	1.10	2.27	.02	9.65
Communist Countries							
1963-64.....	—	—	.54	.01	.02	.01	.58
1964-65.....	—	—	.02	—	—	—	.02
1965-66.....	—	—	—	—	—	—	—
1966-67.....	—	—	.14	—	—	—	.14

^a As well as donations, the U.S. has a variety of other special programs including barter and sales on credit, which are included here, and which involve trade with developed countries. Data based on inspections for export.

Source: Grain Market News, United States Department of Agriculture.

growth in livestock production and consumption, the demand for feed wheat should continue to expand. Specific details of the end use of imported grains is difficult to obtain but there is some indication that an increasing volume of wheat is being imported by the developed countries for use as animal feed, to supplement grains grown in these countries for that purpose.

Wheat Shipments under Aid Programs

Exports of wheat to developing countries have increased considerably in recent years, but a large proportion has been provided under aid programs. The largest supplier of wheat under food aid has been the United States and in recent years the amount sent to developing countries totaled more than 12 million tons (Table 7). During the last four years, more than three-fourths of these shipments have been Hard Winter wheat. Only in 1966-67, when there was a shortage of Hard Winter wheat for the

first time in more than 10 years, did the total exports under the various concessional programs decrease and other types of wheat increase in these programs.

Canada has also shipped wheat under aid programs and, in the last few years, these programs have increased. The bulk of the wheat has been Hard Springs although a little Eastern Soft has also been supplied (Table 8).

While almost the total movement of Hard Winters shipped to developing countries has been under aid programs, most of the other types have been purchased by these countries, including some Hard Springs, Medium Hard (mostly Argentine wheat to neighbouring Brazil) and Soft (mostly lower-priced European).

SUMMARY AND CONCLUSIONS

Since the early 1950s, world exports of wheat and flour increased from 25 million metric tons to more than 62 million metric tons in 1965-66. Canada's

TABLE 8—EXPORTS BY CANADA BY DESTINATION AND BY TYPE OF WHEAT, INCLUDING AID SHIPMENTS

	Durum	Manitoba Hard ^a Northern Spring	Other	Total
million metric tons				
Developed Countries				
1956-57.....	.33	4.98	.23	5.54
1957-58.....	.34	5.31	.18	5.83
1958-59.....	.41	5.14	.17	5.72
1959-60.....	.58	4.80	.10	5.48
1960-61.....	1.09	5.01	.02	6.12
1961-62.....	.18	5.20	.04	5.42
1962-63.....	.54	4.46	.02	5.02
1963-64.....	.41	5.29	.04	5.74
1964-65.....	.43	4.46	.06	4.95
1965-66.....	.44	4.56	.01	5.01
1966-67.....	.46	4.71	.01	5.18
Developing Countries				
		Aid ^b	Aid ^b	
1956-57.....	—	.22	.04	.26
1957-58.....	—	.93	—	.93
1958-59.....	—	.69	.01	.70
1959-60.....	.07	.63	.02	.72
1960-61.....	.01	.49	.16	.51
1961-62.....	.01	.72	.15	.74
1962-63.....	—	.96	.02	.97
1963-64.....	—	.95	.03	.95
1964-65.....	—	1.10	.22	1.19
1965-66.....	—	1.46	.71	1.51
1966-67.....	—	2.04	1.26	2.13
Communist Countries				
1956-57.....	—	.25	—	.25
1957-58.....	—	.55	—	.55
1958-59.....	.03	.32	—	.35
1959-60.....	—	.13	—	.13
1960-61.....	.02	1.73	—	1.75
1961-62.....	—	2.56	.01	2.57
1962-63.....	—	2.13	.02	2.15
1963-64.....	.26	7.41	.22	7.89
1964-65.....	.50	3.30	.04	3.84
1965-66.....	.47	7.30	.55	8.32
1966-67.....	.26	5.37	.20	5.83

^a Manitoba Northern.

^b These figures are already included in the previous columns.

share decreased from 31 per cent during the years from 1949-50 to 1953-54 to 22.5 per cent during the years from 1959-60 to 1963-64, and to almost 27 per cent in 1966-67.

An increase in exports did not occur to the traditional wheat-importing countries. The total trade to developed countries, at about 16 million tons, did not increase because the decline in exports to Western Europe offset the increase to Japan. Trade to developing countries showed a rapid increase from less than 10 million tons to more than 25 million tons in 1966-67. The Communist countries increased imports even faster from a very low level to a total of 21.5 million tons in 1963-64 and 1965-66, but there has been a fairly rapid fall-off during the last two years.

World trade in wheat flour had very little growth during the past 11 years. To developed countries, it declined; to developing countries, it increased slightly; and to the Communist countries, there was little trade.

Exports by types of wheat to developed countries shows Hard Springs declining, Hard Winters and Medium Hard both fluctuating but less so when taken together, and Soft wheat increasing. To developing countries, Hard Winters and Soft wheat show considerable increases. During much of the period, Hard Springs showed a decline, while Medium Hard showed little change. Hard Springs and Soft wheats filled the gap in the needs of the Communist countries, particularly those due to crop fluctuations in the U.S.S.R. and Mainland China.

The full picture of world trade by types shows a large increase in total trade; a small decrease in Hard Winters; a small increase in Hard Springs (which in the late 1950s were more than a third of the

total but are now only a quarter); a relatively unchanged level of Medium Hard; and a large increase in trade of Soft wheats.

The demand for feed grains for livestock has increased rapidly and in many developed countries large quantities of wheat are being consumed as feed. There is some evidence that the lower quality wheats are being imported solely for livestock feed.

Food aid has played a major role in increasing the trade in wheat to the developing countries and the United States has been the major contributor. The bulk of the wheat shipped by the U.S. has been Hard Winter. Canada has in recent years increased aid shipments considerably.

World trade in wheat is made up of many different types of wheat and the purchases by importing countries depend on many factors. One of the factors is the demand by millers for specific types of wheat and this is dependent on the level of production and the type of domestic wheat grown and also on the particular milling practices and consumption habits in that country. Other important factors are normal trading relationships, availability of aid programs or credit facilities and guarantees of supplies. With a few exceptions, during most of the years under analysis there were ample supplies of wheat available for export in all the types analyzed.

REFERENCES

- (1) The author wishes to acknowledge the assistance of the International Wheat Council in making original data sheets available to him and thus facilitating this work.
- (2) For further details, see *Durum Wheat*, International Wheat Council, 1963, and subsequent supplements, and Table 10, *World Wheat Statistics*, 1968, International Wheat Council.

FARM CREDIT REVIEWED

R. S. Rust

In 1963, the first of a series of articles on farm credit was written under the title *How much Farm Credit In Canada? (1)*. In this article an attempt was made to statistically account for all credit extended to farmers from all sources for the year 1961 and for all debts which they had at the end of that year. In subsequent articles statistical summaries on farm credit were made for 1963, 1964 (2) and 1965 (3). In the 1963 article, a major concern was to account for all the sources of credit to farmers and to create an interest in a field which was rapidly growing in importance to agriculture. The major problem was to obtain adequate information on the credit activity of many of the suppliers. While the situation has greatly improved to-day, statistical information on credit from private individuals, from some farm supply finance companies or groups of companies, and by banks are far from adequate and account for the major errors that are made in farm credit estimates.

In spite of the inadequacies of farm credit statistical information to-day, the situation has been steadily improving in recent years. Over 60 sources of farm credit have contributed statistical or other information which has been helpful in making estimates. As a result of this co-operation and of research, the errors and omissions of earlier summaries are becoming increasingly apparent. In addition, estimates for 1960 and 1962 are necessary for research purposes where farm credit is being related to other factors of agricultural production. To meet these needs, new and revised estimates for the years 1960 to 1967 are presented in Tables 1 and 2.

In both Tables 1 and 2, farm credit has been summarized, as in previous summaries, by length of term. While such a breakdown is useful, it can at the same time be misleading since accuracy of classification can not be determined. In some cases, long term loans are made which include credit for short and intermediate term purposes. In other cases, sources of long term credit make intermediate term loans but do not differentiate their credit data by length of term. Sources of intermediate term credit frequently make loans over 18 months but the amount of such loans is not usually known. The amount of money supplied by private individuals who are assumed to be mostly former farmers can only be roughly estimated. While by far the largest amount of credit from this source is attributable to the sale of farms, there are only a few guide lines

which suggest the approximate distribution of credit within time periods.

The estimated amount of farm debt increased from \$1,588.9 million in 1960 to \$3,859.9 million in 1967. Farm investment in land and buildings, machinery and livestock for the same period increased from \$12,680 million to \$21,186 million. The ratio of farm debt to investment in these three categories increased from 12.5 per cent to 18.2 per cent during the period. In the United States farm debt in 1967 represented 19.9 per cent of the total value of farm real estate, machinery and motor vehicles, and livestock.

Total farm liabilities in the United States in 1967 have been estimated at 17 per cent of total farm assets which include the value of farm real estate, machinery, livestock, stored crops, financial deposits and currency, United States savings bonds, household furnishings and equipment, and investment in farm co-operatives (4). Based on recent research findings it has been estimated that the value of stocks, bonds and shares, currency and deposits, life insurance and crops on hand for sale or use make up 13.7 per cent of total assets on Canadian commercial farms. Making allowances for a lower value of such assets on non-commercial farms the total value of assets on all farms has been estimated at \$23,304.6 million (Table 3). Using this value of total farm assets the liabilities of Canadian farmers represent 16.6 per cent of the value of total farm assets compared to the 18.2 per cent when only real estate, machinery and livestock are taken into account. A still lower ratio would occur if allowances were made for the value of household furnishings and equipment and for investments in farm co-operatives. The data on the Canadian debt and investment ratios for the years 1960 to 1967 are shown in Table 3.

Farm debts may be incurred as a result of receiving credit for many purposes and from tax levies. In Table 4, data are presented which indicate the distribution of total commercial farm debt by the purpose of the original loans in the various regions as indicated by a 1964 farm survey. It will be noted from this data that the purchasing of farms, land purchasing, refinancing mortgages and the buying of machinery and equipment accounted for over 60 per cent of the total debt. Whether or not such a distribution of debt is representative of all farms and applicable at the present time can not be determined. It is probable that the proportion of debt on non-commercial farms would tend to differ since fewer land purchases are involved.

TABLE 1—ESTIMATED FARM CREDIT EXTENDED, 1960 TO 1967

Source and term of credit	Estimated farm credit extended						Per cent of credit extended 1967	
	1960	1961	1962	1963	1964	1965		1966	1967^{a}
					millions of dollars			per cent
Long term (over 10 years)								
Farm Credit Corporation.....	52.3	68.9	78.4	96.3	139.8	201.7	234.4	251.2
Veterans' Land Act.....	19.4	15.2	15.7	18.2	15.9	21.1	33.6	31.3
Provincial government agencies.....	37.0	38.1	39.0	40.4	49.4	47.8	51.4	63.6
Private individuals.....	7.0	8.0	8.0	9.0	10.0	11.0	12.0	16.0
Insurance, trust and loan companies.....	3.0	4.0	5.0	6.0	7.0	8.0	10.0	13.0
Treasury Branches (Alberta).....	1.6	1.6	1.4	1.2	0.3	0.6	0.8	0.8
Railway and land companies.....	0.4	0.4	0.2					
Total long term.....	120.7	136.2	147.7	171.1	222.4	290.2	342.2	375.9
								17.1
Intermediate term (18 months to 10 years)								
Banks (FILA).....	101.9	108.1	118.1	136.0	150.8	202.7	212.8	203.7
Private individuals.....	75.0	78.0	79.0	85.0	95.0	108.0	120.0	134.0
Supply company finance.....	29.0	27.0	28.0	30.0	32.0	34.0	38.0	43.0
Insurance, trust and loan companies.....	0.5	1.0	2.0	2.0	3.0	3.0	4.0	4.0
Industrial Development Bank.....		0.2	0.4	4.8	5.9	7.1	6.9	6.1
Credit Unions.....	4.0	7.0	20.0	37.0	51.0	61.0	74.0	90.0
Municipal (Ontario T.D.A.).....	1.3	1.3	1.4	1.6	1.9	1.8	2.2	2.5
Finance companies (cars and trucks).....	8.0	9.0	11.0	12.0	14.0	15.0	15.0	16.0
Treasury Branches (Alberta).....	0.3	0.3	0.4	0.2	0.3			
Sedco (Saskatchewan).....					0.1	0.4	0.5	1.0
Total intermediate term.....	220.0	231.9	260.3	308.6	354.0	433.0	473.4	500.3
								23.0
Short term (up to 18 months)								
Banks (non FILA).....	302.0	363.0	428.0	491.0	541.0	574.0	618.0	733.0
Supply company finance.....	237.0	245.0	256.0	271.0	287.0	307.0	311.0	348.0
Credit Unions.....	51.0	63.0	72.0	75.0	75.0	72.0	70.0	69.0
Finance companies (household and personal).....	6.0	8.0	9.0	10.0	12.0	13.0	14.0	15.0
Dealers, stores, etc.....	25.0	24.0	22.5	21.0	19.5	18.0	19.5	15.0
Private individuals.....	55.0	62.0	71.0	77.0	85.0	90.0	95.0	110.0
Treasury Branches (Alberta).....	8.0	9.5	12.0	14.2	12.5	13.5	12.7	13.1
Total short term.....	684.0	774.5	870.5	959.2	1,032.0	1,087.5	1,140.2	1,303.1
								59.8
Total all credit.....	1,024.7	1,142.6	1,278.5	1,438.9	1,608.4	1,810.7	1,955.8	2,179.3
								99.9

^a Preliminary.

TABLE 2—ESTIMATED FARM CREDIT OUTSTANDING, 1960 TO 1967

Source and term of credit	Estimated farm credit outstanding							Estimated interest charge 1967	Estimated average interest rate	Outstanding as a per cent of 1967 total	
	1960	1961	1962	1963	1964	1965	1966				1967 ^a
	millions of dollars										per cent
Long term (over 10 years)											
Farm Credit Corporation.....	158.4	212.1	270.3	341.2	443.6	586.4	748.5	915.8	47.6	5.2	23.7
Veterans' Land Act.....	91.2	96.6	102.8	110.8	114.6	124.4	147.3	172.3	8.6	5.0	4.5
Provincial government agencies.....	160.0	182.7	204.0	228.3	254.0	275.9	302.2	332.3	12.6	3.8	8.6
Private individuals.....	31.0	33.0	34.0	36.0	40.0	45.0	61.0	65.0	3.3	5.1	1.7
Insurance, trust and loan companies.....	12.0	15.0	19.0	25.0	30.0	38.0	50.0	56.0	4.5	8.0	1.5
Treasury Branches (Alberta).....	1.2	1.3	1.3	1.3	0.9	1.3	0.7	0.9	0.1	7.0	—
Railway and land companies.....	1.6	1.3	0.9	0.6	0.1						
Total long term.....	455.4	542.0	632.3	743.2	883.2	1,071.0	1,309.7	1,542.3	76.7	5.0	40.0
Intermediate term (18 months to 10 years)											
Banks (FILA).....	178.1	193.8	212.6	241.3	273.1	340.9	399.1	432.6	21.6	5.0	11.2
Private individuals.....	300.0	312.0	319.0	342.0	382.0	432.0	483.0	538.0	27.4	5.1	13.9
Supply company finance.....	78.0	81.0	85.0	91.0	96.0	104.0	116.0	131.0	23.6	10.0	3.4
Insurance, trust and loan companies.....	4.0	5.0	7.0	7.0	10.0	12.0	16.0	19.0	1.6	8.5	0.5
Industrial Development Bank.....		0.2	4.2	8.0	12.0	18.0	20.0	22.0	1.7	7.7	0.6
Credit Unions.....	5.0	15.0	37.0	61.0	84.0	91.0	103.0	120.0	10.8	9.0	3.1
Municipal (Ontario T.D.A.).....	4.2	4.9	5.6	6.4	7.4	8.1	9.0	10.0	0.4	4.0	0.3
Finance companies (cars and trucks).....	10.0	12.0	14.0	16.0	18.0	20.0	20.0	23.0	2.8	12.0	0.6
Treasury Branches (Alberta).....	0.4	0.6	0.4	0.2	0.3	1.7	1.4	1.9	0.1	6.0	—
Sedco (Saskatchewan).....					0.1	0.4	0.6	1.3	0.1	7.5	—
Total intermediate term.....	579.7	624.5	684.8	772.9	882.9	1,028.1	1,168.1	1,298.8	90.1	6.9	33.6
Short term (up to 18 months)											
Banks (non FILA).....	241.5	290.7	343.4	392.7	433.0	459.5	494.7	586.6	44.0	7.5 ^b	15.2
Supply company finance.....	178.0	184.0	192.0	203.0	215.0	230.0	243.0	261.0	31.3	12.0	6.8
Credit Unions.....	39.0	55.0	58.0	60.0	60.0	58.0	56.0	55.0	5.5	10.0	1.4
Finance companies (household and personal).....	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	1.9	16.0	0.3
Dealers, stores, etc.....	8.5	8.0	7.5	7.0	6.5	6.0	5.5	5.0	0.4	7.0	0.1
Private individuals.....	44.0	50.0	57.0	63.0	68.0	72.0	76.0	88.0	5.3	6.0	2.3
Treasury Branches (Alberta).....	6.0	6.3	8.0	10.1	9.3	11.0	9.6	9.0	0.7	7.5	0.2
Unpaid taxes ^c	1.8	1.9	1.9	2.0	2.0	2.1	2.1	2.2	0.2	8.0	0.1
Total short term.....	523.8	601.9	674.8	745.8	802.8	848.6	897.9	1,018.8	89.3	8.8	26.4
Total all credit.....	1,558.9	1,768.4	1,991.9	2,261.9	2,568.9	2,947.7	3,375.7	3,859.9	256.1	6.6	100.0

^a Preliminary.^b Reflects a shift during 1966 and 1967 to personal loans.^c Represents 1.5 per cent of total farm taxes. There is some question as to whether this item should be included.

TABLE 3—THE RATIO OF FARM DEBT TO FARM INVESTMENT

Year	Farm Debt	Investment in farm real estate, machinery and livestock ^a	Debt as a per cent of investment	Estimated total investment of farmers ^b	Debt as a per cent of total investment
	millions of dollars		per cent	millions of dollars	per cent
1960.....	1,588.9	12,680.0	12.5	13,948.0	11.4
1961.....	1,768.4	13,159.2	13.4	14,475.1	12.2
1962.....	1,991.9	13,684.0	14.6	15,052.4	13.2
1963.....	2,261.9	14,541.0	15.6	15,995.1	14.1
1964.....	2,568.9	15,790.1	16.3	17,369.1	14.8
1965.....	2,947.7	17,286.8	17.1	19,015.5	15.5
1966.....	3,375.7	19,224.0	17.6	21,146.4	16.0
1967.....	3,859.9	21,186.0	18.2	23,304.6	16.6

^a Source: Dominion Bureau of Statistics.

^b Dominion Bureau of Statistics data plus an additional ten per cent for investments other than farm real estate, machinery and livestock.

TABLE 4—DISTRIBUTION OF FARM DEBT BY PURPOSE OF LOANS ON COMMERCIAL FARMS, BY REGIONS, 1963^a

Purpose	British Columbia	Prairie Provinces	Ontario	Quebec	Maritime Provinces	Canada
	per cent					
Purchase of farms.....	50.2	41.7	49.8	36.0	34.7	43.7
Purchase additional land.....	8.6	15.2	6.6	7.7	6.2	10.3
Land improvement.....	1.9	0.8	1.8	3.2	1.7	1.7
Refinance mortgage.....	8.4	0.9	7.1	11.2	4.7	5.4
New houses.....	2.2	3.9	2.1	3.5	2.1	3.0
Other buildings.....	2.5	2.4	4.6	5.0	3.9	3.6
Breeding stock.....	3.4	3.2	1.4	1.5	1.8	2.3
Machinery and equipment.....	7.2	15.3	7.3	11.1	14.2	11.4
Purchase of trucks.....	0.8	2.4	0.7	1.3	2.6	1.6
Purchase of cars.....	1.7	1.9	1.4	1.4	2.1	1.7
Purchase of feeders.....	— ^b	3.7	2.7	0.3	0.3	2.3
Purchase of poultry.....	0.0	0.1	0.4	0.2	—	0.2
Purchase of feed.....	1.3	0.4	2.0	3.1	1.1	1.4
Purchase of fertilizer.....	0.0	0.2	0.5	0.6	8.4	0.8
Other operating costs.....	6.0	3.4	7.0	1.2	9.4	4.7
Consolidation of debts.....	2.1	1.1	1.6	4.7	4.3	2.1
Household appliances.....	0.2	0.2	0.1	0.4	0.1	0.2
Family living.....	0.2	0.1	0.1	0.6	0.4	0.2
Establishing dependent in farming.....	1.4	0.6	0.1	1.5	—	0.6
Emergencies.....	0.2	0.1	0.1	0.2	0.0	0.1
Taxes.....	0.0	0.9	0.2	0.1	1.6	0.5
Establishing non-farm enterprises.....	—	0.1	0.4	3.0	—	0.7
Other.....	1.5	1.7	1.9	1.4	0.5	1.6
All purposes.....	100.0	100.0	100.0	100.0	100.0	100.0

^a F. A. Mooney and R. S. Rust, An Investigation of Farm Credit on Commercial Farms, Economics Branch, Department of Agriculture, Ottawa.

^b Signifies purposes not reported.

Very little annual information on farm credit is available which would facilitate the making of provincial statistical summaries on agricultural credit or on the extent of farm credit used by specific farm types. Such breakdowns are presently only possible as a result of farm surveys. In view of the value of such a breakdown for research purposes, data are presented in Table 5 which indicate the distribution of farm debt between farm types and

between regions as it is estimated to have existed on commercial farms at the end of 1963.

There are indications that a shortage of money by some credit sources, changing policies and higher interest rates during the latter part of 1967 and the greater part of 1968 slowed down the steady expansion in farm credit activity that has been so evident for several years. Between 1951 and 1961 there was a 29.6 per cent decrease in the number of census

farms and between 1961 and 1966 a further decrease of 11.7 per cent. Many of these farms were absorbed or amalgamated into commercial farm units. Between 1951 and 1961, the number of commercial farms increased by 10.9 per cent, and between 1961 and 1966 a further increase of 6.9 per cent occurred. The steady increase in the average size of farm and to some extent the increase in the number of commercial farms has resulted from the purchasing of non-commercial units. At least 44 per cent and possibly 50 per cent of farm debt at the end of 1963 was due to farm and land purchases (Table 4). Since owners of small non-commercial farms are more likely to sell land than lease it and because there is a need for many commercial farms to further expand acreage, the demand for credit for land purchasing is likely to remain strong.

It is possible that higher interest rates, coupled with slightly higher land prices may shift some of this demand towards credit for farm intensification purposes. On the other hand, the increasing cost of inputs associated with farm intensification and the

scarcity of suitable labor will probably prevent a rapid change in this direction. As farms become more highly commercialized credit requirements may be expected to increase. It is evident that there will be a need for the continued development of sound credit programs and policies to enable farmers to increase incomes and to maintain or improve their competitive position in domestic and international markets.

FOOTNOTES

- (1) R. S. Rust, How Much Farm Credit In Canada?, *The Economic Annalist*, Economics Branch, Canada Department of Agriculture, Vol. XXXIII, No. 1, February 1963, pp. 8-12.
- (2) R. S. Rust, Farm Credit Expansion In Canada, *Canadian Farm Economics*, Economics Branch, Canada Department of Agriculture, Vol. 1, No. 1, April, 1966, pp. 23-26.
- (3) R. S. Rust, The Growth of Agricultural Credit In Canada, *Canadian Farm Economics*, Economics Branch, Canada Department of Agriculture, Vol. 2, No. 2, June, 1967, pp. 16-18.
- (4) Ratios are based on data supplied by the Farm Credit Administration, Washington D.C. September, 1968.

TABLE 5—DISTRIBUTION OF FARM DEBT ON COMMERCIAL FARMS BY FARM TYPE AND REGION, 1963^a

Farm type	British Columbia	Prairie Provinces	Ontario	Quebec	Maritime Provinces	Canada
	per cent					
Dairy.....	53.2	5.4	28.8	67.0	22.7	23.6
Livestock.....	11.1	33.8	43.3	17.8	31.5	33.4
Poultry.....	6.1	1.3	2.9	3.2	— ^b	2.2
Wheat.....	—	35.2	0.4	—	—	17.8
Small grains.....	—	17.6	5.6	0.1	0.2	10.5
Field crops.....	2.3	4.6	10.0	4.2	31.2	6.5
Fruit and vegetable.....	27.0	—	7.3	5.0	9.4	3.9
Forestry.....	—	0.0	—	0.4	1.6	0.1
Other.....	0.4	2.1	1.7	2.3	3.3	2.0
All types.....	100.0	100.0	100.0	100.0	100.0	100.0
Regional as a per cent of total debt.....	3.5	49.1	30.6	14.8	2.0	100.0

^a F. A. Mooney and R. S. Rust, *An Investigation of Farm Credit on Commercial Farms*, Economics Branch, Department of Agriculture, Ottawa.

^b Signifies farm types not sampled.

NATIONAL FARM PRODUCT MARKETING LEGISLATION AND ORGANIZATION

J. D. F. Kidd and G. A. Hiscocks.

The growing involvement of large corporations in farm products marketing and production raises the question as to whether farms will remain as an important independent sector in the overall economy of Canada. Particular sectors of farm production, for example, poultry meat, eggs, livestock feeding and fruit and vegetables, appear very susceptible to the inroads of industrialization. Smaller firms that are processing and marketing farm products have been more subject to these trends toward large corporate organizations than have farmers. In view of these developments alone, there is reason for farmers, in association with governments, to evaluate their competitive market position, and to develop new forms of organization, such as national marketing boards, that will contribute to their ability to survive and to protect their way of life in farming.

In considering the desirability of national marketing plans for farm products, careful attention should be given to the advantages of large scale organizations in connection with the production and marketing of farm products. These advantages seem to rest upon the ability of large economic organizations to plan and manage the markets in which they operate, both on the input or buying side and on the output or selling side of their operations. In fact, through the corporate device of horizontal and vertical integration, many of the stages in the marketing process for industrial products, and to an increasing extent, many of the steps in the marketing of farm products, have either been eliminated or effectively controlled. This concentration of several phases of production and the elimination of the need to go through the market place at every phase is one of the important features of the industrial system at the present time.

The influence and control over a number of sectors of the production and marketing process which these large organizations obtain through vertical or horizontal integration enables them to organize on a large scale and with reasonable stability of costs. Thus there is greater assurance of return on capital and this facilitates the generation of new capital and the application of new technology. A number of these corporate giants already exist within the food-feed economy of Canada.

Even so, most of agricultural production and marketing is still composed of a large number of relatively small production units all making independent decisions as to production plans and timing,

place and size of marketings. There are some significant advantages to be gained by farmers from a national marketing organization designed to operate to their benefit. Such a national marketing agency for farm products would probably employ many of the techniques of market management that are employed by the large corporate organizations. This would involve planning of Canadian and export market requirements in order to co-ordinate production and marketing programs with the overall demand at a reasonably stable and adequate price level. The agency could also undertake at a national level the promotion of food products. Marketing research and development could be another important function of the national agency.

The British North America Act divides marketing powers between the Federal and the Provincial Governments. Agricultural marketing within a province is under the jurisdiction of the province, but inter-provincial and export trade is under the jurisdiction of the Federal Government. Thus the establishment of a regional or national organization with powers to control marketing both within a province, between provinces and for exports and imports, raises a number of legal issues. There are several ways in which national marketing agencies could be organized and it is useful to develop a few models to illustrate these. At the same time, some indication of the range of possible structures and activities within any particular model can be considered. Because the operations of a national agency would require legal sanction in an area of joint federal-provincial jurisdiction, legal considerations as well as economic considerations are equally important in evaluating the feasibility of these models. However, in illustrating these models, prior consideration has convinced us of their relevance within the legal framework of Canada. The economic aspects of these models are discussed within the context of various legislative situations that are believed to be realistic.

MODEL A: NATIONAL CO-ORDINATION OF PROVINCIAL PLANS

Provincial marketing boards for a number of farm products that are produced and marketed widely in Canada are operating in one or more provinces of Canada. Several of these producer marketing boards have been delegated federal powers under the Canada

Agricultural Products Marketing Act. These powers relate to the extension of federal controls over inter-provincial and export marketings, and complement controls over intra-provincial marketings derived from provincial marketing legislation.

The various provincial plans are operating in Canada without any formal co-ordination of inter-provincial and export marketings. In effect, a competitive market situation prevails—either among producer boards in the various provinces and/or among organized producers and unorganized producers. A difficult situation could develop if a producer marketing board in any particular province undertook an aggressive marketing program, and reduced selling prices in other provinces below selling prices in the home province. Such action would constitute a form of price discrimination and would be injurious to producer interest in the other provinces and to consumer interest in the home province.

The development of some form of effective national co-ordination of provincial marketing plans may be required. It would be possible for the provincial marketing boards to establish a joint national agency to which the Federal Government would delegate its powers, under the Canada Agricultural Products Marketing Act. This kind of arrangement would appear to be most feasible in the case of products such as live broiler chicken, live turkeys and hogs for slaughter, which do not move extensively in either inter-provincial or international trade but where the production developments and price relationships between the provinces are important.

The joint agency would be responsible for co-ordinating the production, marketing and pricing policies of the producer boards. This might be relatively simple in the case of broiler chicken where provincial production corresponds quite closely to provincial market requirements, but it would be more difficult in the case of turkeys and hogs, where there is a larger volume of inter-provincial and foreign trade in processed products. If the producer boards decided to determine and to allocate a national quota through their joint agency, the joint agency could also use federal powers to regulate inter-provincial and export trade in the designated products. Provincial price levels would presumably have to be set in relation to the allocation of marketing quotas among the provinces, and to the national distribution of processed products. That is, the regional price pattern for live turkeys, for example, would reflect the cost of distribution from surplus to deficit markets within the country.

Under this arrangement, the main functions of producer boards would involve the administration

of quotas among producers and the negotiating of live product prices with the processors. These functions are in reality of an administrative nature rather than of a marketing nature. As is the situation at present, the processing and marketing functions for poultry, meat and hog products would continue to be handled by the existing markets with little or no control or regulation by the national agency.

A joint national agency of producer boards would need to determine domestic and export market requirements and to co-ordinate the production and marketing programs of the producer boards. This should result in greater overall supply and price stability. Product promotion and marketing research could be undertaken by the national agency and financed on a joint basis by the producer boards.

The main difficulty with this type of plan appears to be the problem of reaching mutual agreement among producer boards and among governments on the principles and practices of market sharing. There is some danger that prices of the regulated product may be unduly raised, and that cost reducing changes in the location and organizational structure of producing and marketing firms may be inhibited under the provisions of the plan.

MODEL B: NATIONAL MARKETING BOARD

In contrast to the arrangement where federal powers are delegated to a joint provincial agency, some situations may require delegation of provincial powers to a federal agency. This arrangement might be quite applicable for apples and potatoes where production controls would appear to be ineffective in planning crop output to correspond with market requirements. Yield variability, which is largely related to the uncertainty of weather, accounts for most of the annual variation in crop output. In addition, these products are moved extensively in both inter-provincial and international trade largely in the natural form having been subject only to grading and packing.

A central selling agency for apples and potatoes at the national level might be able to perform important functions related to marketing and price stabilization. In past years, producer incomes from the sale of these crops have been unstable because of the variability of crop production in Canada and because of price fluctuations in export markets. Although the main market for both these products is for fresh use in Canada, price levels in export markets have a significant influence on the domestic price levels, especially for potatoes.

In addition to the export market, a smaller but important processing outlet exists as an alternative to either the fresh domestic market or to the export

market. For apples, this utilization is largely a salvage operation for culls and for varieties and grades which are marginal for fresh or export markets. Under conditions of plentiful supplies, a national marketing board could ensure that a larger percentage of the crop was directed to processing, thereby easing downward price pressures on the domestic fresh market.

The national marketing board could establish a trading arm or it could designate a central selling agency or it could instruct the trade. Registered warehouses (grading, packing and storage) could be licensed as agents of the national board. The central selling agency could consist of a sales planning section that would develop a marketing strategy on the basis of crop prospects and market requirements for the products. The marketing plan would include a storage program for fresh products related to the requirements of the domestic and export markets. A storage program for processed products could also be instituted under conditions of excessive production. Price pooling among producers would also be possible.

The main advantage of a national selling agency would appear to be that aggregate producer returns from the sale of the crop could be increased as compared with aggregate returns under present marketing arrangements. The main problem would appear to involve reaching agreement among producer boards on the quantities, varieties, qualities, etc. of product to be diverted to secondary market outlets.

MODEL C:

A NATIONAL MARKETING COMMISSION

A type of organizational structure that was recommended by the Egg Marketing Conference (June 1968), sponsored by the Canadian Federation of Agriculture, was called the national commission approach. This would differ from a national board in that it would involve joint planning of production, marketing and pricing with producer boards at the provincial level. It would differ from Model A largely in its legal basis. Model A requires the provinces to set up a joint agency to which the Federal Government delegates powers and this model requires the Federal Government to establish a commission with joint planning by provinces and possibly delegation of powers by provinces. The producer boards would administer marketing quotas within each province. The national commission could perform the following functions:

(1) Determine Canadian and export egg requirements for both table and processing eggs. Estimated egg requirements could be set in relation to a domestic price target for shell eggs.

- (2) The national quota could be allocated to provincial boards according to a principle or mechanism that is still to be resolved. The allocation of national quota was the major point of disagreement among producers at the Egg Marketing Conference. The Conference Report expressed confidence that conflicting regional producer interests in this matter could be negotiated and settled.
- (3) The commission could exercise federal powers to regulate the inter-provincial trade in shell eggs within Canada. It is not envisaged that the commission would become involved in the physical distribution of shell eggs in Canada, but would merely ascertain that provincial marketings were kept within the limits of prior agreements on market sharing.
- (4) The commission could also exercise similar powers with respect to international trade in shell eggs, and the Conference recommended that the commission be sole agent with authority to import eggs. It was argued in the Conference Report that this power was necessary in order to insure that surplus or dumped imported product would not undercut the domestic marketing program. It was not envisaged that the commission would restrict imports whenever domestic price levels were above target price levels.
- (5) Another function of the commission would be to purchase and divert shell eggs to further processing whenever heavy seasonal production was causing intolerable pressure upon domestic price levels. It was suggested that this function would be relatively minor and in the nature of price insurance. A major objective of the commission would be to encourage a reliable and adequate supply of high, quality eggs, but it was recognized that uncontrollable natural factors still influence the level of egg production throughout the year. Various forms of promotion, advertising, etc., would undoubtedly be used in addition to diversion to processing, but this is a matter in which the commission would gain new knowledge from experience and research.
- (6) Promotion and marketing research were recognized as being another important function of the commission.

As is the case with Model A and B, one of the main difficulties with Model C is the area of market sharing. The delegation to the commission of international trading powers is also a matter which requires a good deal more consideration. The principal advantage of the commission approach for eggs is that supply and price instability of the egg market could be considerably reduced.

LEGISLATION, STRUCTURE AND FINANCING

The various models of new marketing forms for farm products do not exhaust all the possible variations. As has been pointed out earlier, it is believed these models constitute the most important main forms that are feasible from the legal as well as from the economic points of view. In order to be brought into existence, new or amended farm marketing legislation at the national and provincial levels may be necessary. At the federal level, this may take the form of a general marketing act which would be sufficiently broad to encompass the alternative forms of organization, or it may take the form of special

acts, such as the Canadian Dairy Commission Act, for individual products.

There are many other features which have not been considered here. For example, the structure of these new organizations from the point of view of representation of producer, trade, consumer or government interests in the formulation and execution of their policies, is an important factor. Should it be considered desirable, it seems probable that these organizations could derive all of their revenue directly from the market rather than from governments, but the matter of financing is also important if new market organizations are to be developed on a national basis for agricultural commodities.

STARTING POSITION AND PATTERN OF DEVELOPMENT OF STARTING FARMERS IN THE ROSETOWN-ELROSE AREA OF SASKATCHEWAN

R. G. Wiens

Two of the trends that have been taking place in western agriculture over the past several decades are the increase in farm size and the increase in land values, both of which have increased the difficulties of gaining entry into the farming industry. The increase in farm size has been constant after the immediate post war adjustment. This set of events has forced a change in the agricultural ladder. This was the process by which many young men are said to have climbed to farm ownership (1) and consisted of four major rungs or stages. These were unpaid family labor on parents' farm, hired man, tenant operator and owner operator. Now the vastly increased capital requirements for a viable farming unit have modified considerably the path of entry. Important aspects of reaching farm ownership now are the substantial aid of relatives who are already established in the farming industry, renting all or part of the farm unit, government credit policies and off-farm employment.

A survey was taken of 28 farmers in the Rosetown-Elrose area of Saskatchewan, who had started farming within the last 10 years. Twenty-seven of these 28 farmers started with help from relatives, 26 rented some land during the initial years of farming, 14 used Farm Credit Corporation financing, 12 had used Farm Improvement Loan financing, and 22 had off-farm employment for some of the initial years of farming.

The purpose of this survey, taken in June 1968, was to help answer questions such as: who are the people who are starting out in the agriculture industry today, and what progress are they able to make towards establishing an "economic" size of farm unit within a reasonable period of time?

CHARACTERISTICS OF STUDY AREA

The data were collected from the R.M. of Monet No. 257 and the R.M. of St. Andrews No. 287. Most of the land in these two rural municipalities consists of Regina Heavy Clay soil. This means that the land in these rural municipalities is characterized by smooth, nearly level topography with a high percentage of cultivated land. The cultivated land is characterized by its dark greyish-brown color, granular structure and the absence of stones, gravel and alkali sloughs (2). Most important of the crops grown is wheat, because this soil is among the best for wheat growing in Saskatchewan.

About 32 per cent of the R.M. of Monet is community pasture, and about 54 per cent is Class IV

or Class V land, excellent for grain production. The R.M. of St. Andrews is 83 per cent Class IV and Class V land.

Because of the high percentage of excellent grain growing soil, many of the farms specialize in grain production. Only a few of the farms, 20 per cent, had a commercial sized beef enterprise. There was a slight increase, since 1959, in the percentage of farms which had no cattle and a slight decrease in the number that had cattle only for home consumption, indicating that there is a trend towards specialization of enterprises rather than having small operations taking time from the major farm business. This trend was much more marked in other livestock enterprises, with the population of hogs, sheep and poultry declining rapidly.

The main commercial centres in these two municipalities are Rosetown and Elrose. A number of smaller centres, Zealandia, Sovereign, Houghton and Glamis, are scattered throughout the district.

The Rosetown-Elrose area is generally thought of as being dominated by large farms. However, in 1959, a survey in the area showed that more than half of the farms were one section or less and about one-fifth of the farms were one-half section or less. The average farm size in that year was 724 cultivated acres. By 1964, the average size had increased to 870 acres and the number of farms had decreased by 15 per cent, from 523 to 445 farms (3).

CRITERIA FOR SELECTING THE SAMPLE

As is mentioned above, the purpose of the survey was to study the initial position and development pattern of beginning farmers. The relevant period of time chosen was 10 years as this allowed comparisons of development patterns of the farm units and yet was applicable to today's farm size structure. A list of 30 farmers in this category was made from local farm and non-farm contacts. The list was not exhaustive.

Although the Rosetown-Elrose area was chosen partly because of its grain farming emphasis, no restrictions were placed on size or number of enterprises per farm. The only condition was that the individual had been farming for 10 years or less. A total of 28 farmers was interviewed.

INITIAL POSITION

From the data gathered from the sample of 28 farmers, the following picture of the beginning farmer and his farm emerged.

The Farmer

Age and Education—At the time these farmers first rented or purchased land under their own name, the average age was 21 years. Thirteen were 20 years old or younger; 11 were 21 to 25 years old; and four were more than 25 years of age. Twenty had finished high school and some were still going to school in the off-season. The average number of years of formal schooling was 12.5 years (Table 1).

Off-Farm Employment—Ten of the 28 farmers had off-farm employment when they started farming. Of these farmers, seven had casual employment in the local area and the other three had slack season employment away from the local area. The average off-farm earnings for this group was \$2,226 per year and the average for all farms was \$795 per year (Table 2).

Farm Residence and Living Costs—There are three important aspects of living costs: 1) whether a separate residence is maintained by the farmer, 2) whether residence is at one place for the whole year and 3) the family status. Only nine maintained a separate residence on or near their farms and two of these for the crop season only. Of these nine farmers, six lived in a house on rented land; two in a house on purchased land; and one rented a house separate from any farm land agreement. The other 19 farmers when starting to farm lived with their parents but 10 of these for the crop season only. Thus, in terms of accommodation only one farmer did not have living accommodation on his farm or with his parents.

Family status is the third significant factor affecting cash living costs. Twenty were single when starting to farm.

The distribution of cash living costs was as follows: less than \$2,000 for 14 farmers; \$2,000 to \$2,999 for 8 farmers; and \$3,000 and over for 6 farmers. The average was \$1,996 (Table 3).

The Farm

Land Base—The beginning farmer worked an average of 450 acres in his first year, owning 83 acres and renting 367 acres. Of the 28 farmers, only 8 owned some land at the time they started. The average amount of land owned by these 8 farmers was 291 acres. Of these 8 farmers, 4 also rented land, an average of 273 acres, giving them an average total land base of 564 acres, 52 per cent of which was owned. This compares with the average land base of 450 acres, of which only 18 per cent was owned for all 28 beginning farmers.

Of the eight farmers who owned land, six purchased this land from non-relatives, one purchased some land from a parent and some from a non-relative, and one farmer had the land given to him

by his father. Six of the seven buying land from non-relatives borrowed all the money for the purchase and one farmer made a 16 per cent cash down payment out of savings he had accumulated. Five out of the seven farmers used Farm Credit Corporation financing; one borrowed from the bank; one from the Credit Union; and the land bought from the parent was on an agreement for sale. Six used their parents' land as collateral for their loans and one used non-farm property which was a house in town. These six farmers had no security to put up for their loans, but they were able to obtain the loans by using the titles to their parents' land as collateral. If this had not been available, they would not have been able to obtain the money from the Farm Credit Corporation, and quite possibly not at all.

Twenty-four of the sample of 28 farmers rented land when they started farming, an average of 428 acres each. The most common rental agreement used was a one-third crop share lease, with the landlord paying the taxes. Seven farmers had all their rental contracts with non-relatives. Relatives, unless otherwise specified, refers to brother, sister, uncle, aunt or parent.

Size at Time of Starting—One of the trends shown is the starting size of farm as related to the time of starting. The farmers who started between 1958 and 1961 inclusive (six of them) had an average total land base in their first year of 414 acres. The average land base in the first year of farmers who started between 1962 and 1964 (11 of them) had 395 acres, a slight decrease from the previous group. However, in the group that began farming in the 1965-1967 period (11 of them) the average for those starting in 1967 alone (5 of the 11), is up to 594 acres. A correlation analysis of the relationship between the year started and the starting size of farm shows that the relationship is highly significant. The correlation coefficient expressing this relationship is .758.

Machinery Requirements—Most of the farmers had little or no capital to invest in machinery in their first year of farming. Besides, it was usually not necessary for them to have their own equipment because most had their father's equipment available for use.

Fifteen of the farmers worked for their fathers during the first year and used their fathers' equipment in exchange. Two farmers began buying the full line of equipment from their parents through an agreement for sale; three rented the full line for cash; two had equipment included in their rental contract; one paid cash for all equipment, and one began purchasing a part interest in his father's line of equipment through an agreement for sale. The four remaining farmers contributed the use of their own equipment to supplement the full line of equipment of their parents. Only three farmers borrowed money

to buy machinery, and these all did so through the bank with a Farm Improvement Loan.

Building Requirements—The situation for buildings was similar to that for machinery; the beginning farmers had little or no capital to invest in buildings. Seventeen farmers simply used their fathers' buildings for grain storage and machinery storage, if any of the machinery was their own. Eight farmers used buildings which were rented and two purchased land with buildings included. One farmer had a combination of the above arrangements.

PATTERN OF DEVELOPMENT

The Farmer

Education Level—The mean education of all the farmers as of 1967 was 12.7 years, an increase of only .2 years per farmer (Table 1). This seems to indicate that most of these farmers completed their education before they began their farming careers. Some of them, however, were still in the process of completing the requirements for a diploma in vocational agriculture, or a degree in agriculture.

Off-farm Employment—It was expected that the percentage of farmers with off-farm income would decrease as the farmers built up their farm unit in terms of size. However, the opposite was true (Table 2). The reason for obtaining off-farm employment was not specifically asked. However, it would appear that important reasons were the increasing debt obligation resulting from machine, building and land purchases and the increasing living cost associated with the establishment of family units. This trend was not only correlated with number of years farmed but also with time. In 1967, 71 per cent of the 28 farmers had income from off-farm employment.

Living Accommodation and Living Costs—In their first year of farming, 19 of the 28 farmers (68 per cent), lived with their parents either the full year or during the summer only. Of the 23 who farmed in the second year, 16 had this type of living accommodation, i.e., 69 per cent of them. From the second year, there was a steady decline in the percentage who lived with their parents either full or part time, until in the ninth year none of the remaining farmers lived with their parents (Table 3). The trend was towards living on their own farms, either full time or for the crop season only.

These 28 farmers also tended to increase the amount they spent on cash living costs the longer they farmed (Table 3). In their first year their average expenditure was \$1,996. During the following years the amount spent increased steadily to a high of \$4,433 in the ninth year. These costs included expenditures on semi-durable goods such as cars and furniture. Gilchrist (7), in his thesis, shows that consumption is a function of two factors, income and

family size. This coincides with the findings of the survey. Their average cost of living goes up because some of the 20 of those who were single when they started farming, married; and also, some had the size of their families increased by the addition of children. In addition, their income was increasing.

The Farm

Land Area—The average farm size in the second year of farming was 484 acres, compared with 450 acres in the first year. The 34-acre increase in size was composed of an increase of 24 acres purchased and 10 acres rented. However, this purchase expansion is accounted for by only four farmers. One other farmer rented an additional 430 acres in his second year of farming. In addition, one farmer purchased land which was rented the first year.

The 3 farmers of the sample who had farmed 9 years when the survey was taken, had built up their farm size to an average of 1,437 acres from a starting size of 320 rented acres. These farmers rented 82 per cent of their land in their first year of farming; this percentage declined to 78 per cent in the fourth year, and then rose to 89 per cent in the ninth year. The owned acreage indicates that accumulation of equity was small. Farm expansion was by renting more land. This pattern indicates the young farmer was using his limited capital for non-land inputs to obtain a quick expansion of farm size.

Machine Purchases—During the first six years there was an almost steady increase in the percentage of farmers who purchased some machinery. In their sixth year, 70 per cent of the farmers made additions to their existing machinery inventory. Then, in the seventh, eighth and ninth years, the percentage of farmers who bought machinery dropped to 33 per cent, 17 per cent and 33 per cent, respectively. This indicates that these farmers had probably built up their machinery inventory to the point where extensive purchases, or any purchases were not necessary. For those still farming in partnership with their fathers, it probably means that their machinery complement had built up to a point where their machinery plus that owned by their father was enough to cover the total land farmed.

Reinvestment Capital—The generation of capital for farm expansion for the average starting farm size under modal operating arrangements is potentially substantial. On a starting farm unit of 450 acres, 367 rented and 83 owned, an average yield of 20 bushels per acre (the 1940 to 1966 average) on a two-thirds-one-third rotation with wheat at \$1.70 per bushel, and after paying the landlord one-third of the crop from the rented land, and deducting seed requirements the gross income per farm is approximately \$6,700. In addition, he has off-farm earnings of about \$800, bringing his gross income to

\$7,500. To determine the amount of this which is available for reinvestment, the following deductions must be made. In the modal farm arrangement the starting farmer had free use of machinery and equipment and thus the only farm expenses were cropping expenses of approximately \$1,750 (4). In addition, he had living costs of approximately \$2,000 a year and income taxes on this income would be \$1,100. Thus, \$2,650 a year are available for reinvestment and servicing of existing debts with the assumed yields and prices. He is able to invest this much money from a land base of this size because of the help he is receiving from relatives, usually parents. As was indicated earlier, almost all the machinery that works his land is his father's, and the son simply contributes his labor input to his father's land in exchange. Usually his father pays for all the variable inputs related to this machinery such as gas, oil, and repairs which means that he has virtually no cash expenses for his land except taxes, seed, fertilizer, and spray inputs. The son also uses either his father's buildings or buildings on rented land for grain storage, so his cash expenditures for upkeep on buildings is also minimal. This means that he has almost all of the \$2,650 for debt repayment and to build up his farm unit. If this farmer had been starting on his own by buying his own machinery and keeping it up, building and keeping up granaries plus other farm buildings in addition to variable costs, the difficulty of generating reinvestment capital becomes apparent.

In the farm development process most of the farmers in the sample assumed all farm expenses by the sixth year and in addition, living costs increased. Thus, the amount available for debt servicing and reinvestment increased less than proportionately to farm size. The ending farm size of those farmers having farmed nine year was 1,277 acres. With the same yield, price and cost structure gross income after rent was \$18,300. These farmers as independent operators now pay all expenses. These would be approximately \$10,250 (landlord pays half the taxes) (5) (6). After adding \$1,900 for off-farm income, deducting income taxes of \$1,750 and living costs of \$4,433, the amount left for principal and interest payment and reinvestment would be approximately \$3,750. The income tax cost would be reduced if there were interest payments. This amount remaining for debt servicing and reinvestment is only \$1,100 higher than for the initial years of farming in spite of the much larger farm size and higher off-farm income. But now the farmer has assumed all the expenses of an independently owned farm unit and living costs have increased substantially. The eventual ownership of these units will involve a combination of continued substantial savings, large amounts of credit and inheritances. Nineteen would buy more land now if

"available" and would need Farm Credit Corporation financing and in most cases would require collateral from parents. An additional six farmers were not interested in buying more land since they were carrying a full debt load (all F.C.C. financed).

SUMMARY

It is observed from the information gathered that the starting farmer of recent years was young with a high level of education. As the technical demands of farming increase, the level of education of the starting farmer can be expected to continue to rise. In addition to the education they had when starting farming, some of them were in the process of going to school when they started farming and some of them went back for more schooling at some time after they started farming.

These starting farmers depended heavily upon family assistance to get started. Most had close relatives, usually parents who were already established in the farming business. This situation offered several advantages. The young farmer had collateral available to borrow money; he had a line of machinery available to work his land; he had buildings in which to store his grain; he had his father's reputation to back him in obtaining rental contracts, and most of the time he had an excellent opportunity to reduce his living costs by living with his parents. These advantages have almost become necessities to gain entry into the farming business, the major reason for this being the tremendous rise in capital requirements for establishing an "efficient economic unit" of six to seven quarter sections of land.

At the same time many of these farmers had other relatives who farmed in the district or else had retired from farming. This quite often presented excellent opportunities for renting or buying land, sometimes with preferential prices or rental contracts.

The starting farmers made extensive use of government credit institutions. Most of them, when they borrowed money to buy land, borrowed it from the Farm Credit Corporation, using their parents' land, as collateral. For buying machinery most of them used Farm Improvement Loans. These low interest loans are one more aid which they need to be able to build up an "economic" farm unit. Earnings from off-farm employment are significant for the whole period. All of these factors have allowed expenditures on living costs to be at "satisfactory" levels. However, the per cent of farmed land rented by these 28 farmers is substantially above the district average of approximately 25 per cent. Therefore, it can be expected that in the future some of these farmers will require large long-term loans to buy much of this rented land.

TABLE 1—EDUCATION LEVEL OF 28 FARMERS WHEN STARTING TO FARM AND AS OF 1968

Education Level	Starting Position		Ending Position	
	Number of Farmers	Per Cent	Number of Farmers	Per Cent
Less than 10 years.....	3	11	3	11
10-12 years.....	11	39	10	36
1-2 years college.....	10	36	9	32
More than 2 years college.....	4	14	6	21
Average Years.....	12.5		12.7	

TABLE 2—SUMMARY OF OFF-FARM EMPLOYMENT INCOME FOR 28 FARMERS

Year of farming	Number of Farmers	Per cent with Off-Farm Employment	Average Dollar Earnings for All Farms
First.....	28	35.7	795
Second.....	23	47.8	787
Third.....	21	61.9	1,048
Fourth.....	17	70.6	1,118
Fifth.....	13	76.9	1,508
Sixth.....	10	90.0	2,135
Seventh.....	6	50.0	1,117
Eighth.....	6	50.0	1,117
Ninth.....	3	100.0	1,900

TABLE 3—SUMMARY OF LIVING ACCOMMODATIONS AND CASH LIVING COSTS

Years of Farming	Number of Farmers	Cash Living Costs	Living Accommodation				Off-Farm
			Independently on Farm		With Parents		
			Full Year	Crop Season Only	Full Year	Crop Season Only	
		dollars			per cent		
First.....	28	1996	21	7	32	36	4
Second.....	23	1839	22	9	39	30	—
Third.....	21	2090	24	9	43	24	—
Fourth.....	17	2088	35	12	29	24	—
Fifth.....	13	2553	31	15	39	15	—
Sixth.....	10	2440	40	30	20	10	—
Seventh.....	6	2708	50	33	—	17	—
Eighth.....	6	3383	50	33	—	17	—
Ninth.....	3	4433	67	33	—	—	—

TABLE 4—TIME SERIES AND CROSS-SECTION SUMMARY OF FARM SIZE OF 28 FARMERS.

Year of farming	1st	2nd	3rd	4th	5th	6th	7th	8th	9th
Number of farmers.....	28	23	21	17	13	10	6	6	3
Average farm size									
(1) owned acres.....	83	116	127	142	208	191	424	443	159
(2) rented acres.....	367	355	408	494	537	556	626	742	1,118
(3) total acres.....	450	471	535	636	745	747	1,050	1,185	1,277
Distribution in quarter sections									
1-2.....	13	10	6	3	1	2	—	—	—
3-4.....	11	8	9	9	6	3	1	1	—
5-6.....	3	5	6	3	4	3	2	1	1
7-8.....	1	—	—	1	1	1	1	2	1
9+.....	—	—	—	1	1	1	2	2	1
Years of active farming (1968 position).....	1	2	3	4	5	6	7	8	9
Average farm size (acres).....	641	205	591	505	627	609	—	1,042	1,277
Number of farms.....	5	2	4	4	3	4	—	3	3
Distribution in quarter sections									
1-2.....	1	2	1	1	—	1	—	—	—
3-4.....	2	—	1	2	2	2	—	1	—
5-6.....	1	—	2	1	1	1	—	—	1
7-8.....	1	—	—	—	—	—	—	1	1
9+.....	—	—	—	—	—	—	—	1	1

FOOTNOTES

- (1) J. C. Gilson, *Strengthening the Farm Firm*, Faculty of Agriculture and Home Economics, University of Manitoba, Winnipeg, Manitoba, Agricultural Economics Bulletin No. 6, April, 1962.
- (2) J. Zeman, *Changes in Farm Organization on Prairie Grain Farms on Regina Heavy Clay Soils of the Dark Brown Soil Zone*, Canada Department of Agriculture, Economics Division, Saskatoon, Saskatchewan, April, 1962.
- (3) M. Ragush, *Changes in Farm Organization, Heavy Productivity Soils, Dark Brown Soil Zone, Saskatchewan, 1965*, Economics Branch, Canada Department of Agriculture, Regina, Saskatchewan, December, 1966, Publication 66/18.
- (4) *Saskatchewan Farm Business Summary 1966*, Extension Report No. 13, July, 1967.
- (5) M. Ragush, *op. cit.*
- (6) *Saskatchewan Farm Business Summary, 1966, op. cit.*
- (7) V. Gilchrist, *Capital Accumulation Agriculture Firm Household*, A Thesis Submitted to Oregon State University, June, 1963.

POLICY AND PROGRAM DEVELOPMENTS

Ontario Bean Producers' Marketing Order—An Order in Council has authorized the Ontario Bean Producers Marketing Board to sell graded pea beans and yellow-eyed beans on a co-operative plan.

The Board will pay producers an initial price of \$5.50 per hundred pounds of beans delivered. If the average wholesale price realized for the Beans is less than the initial price plus the average costs of carrying and processing, the Board will be paid the difference by the federal government.

The federal government will not make any payments if the average wholesale price is more than \$6.79 per hundred pounds. The total payments by the government cannot exceed \$1 million.

This agreement remains in effect until December 31, 1969. (June 28, 1968)

Director General Appointed—Dr. Glen R. Purnell has been named Director General of the Economics Branch. Dr. Purnell was Director of Economics for the Alberta Department of Agriculture from 1961 until his federal appointment. (August 21, 1968)

Senior F.C.C. Appointment—Dr. M. E. Andal has been appointed Economic Advisor to the Farm Credit Corporation effective October 1. Dr. Andal has been Director of the Farm Economics Services Division of the Economics Branch since 1964. (August 29, 1968)

PUBLICATIONS

ECONOMICS BRANCH PUBLICATIONS

Economics of Grain—Fallow Rotations and Fertilizer Use in the Prairie Provinces, MacKenzie, J. G., Economics Branch, Canada Department of Agriculture, Regina, Canada, 1968. Pub. No. 68/9, pp. iii+42.

The economics of grain—fallow rotation and the effects of fertilizer use are discussed for low, medium and high productivity soils in the Dark Brown, Brown Black and Grey Wooded Zones of the Prairie Provinces. The most suitable length of rotation under various conditions is given for each soil zone.

An Investigation of Farm Credit on Commercial Farms, Mooney, F. A. and R. S. Rust, Economics Branch, Canada Department of Agriculture, Ottawa, 1968. Pub. No. 68/8, pp. vi+88.

Data on farm credit outstanding, interest rates and credit requirements of farmers are presented in this publication. Also included are farmers' opinion of the terms and conditions of credit.

UNITED NATIONS PUBLICATIONS

Available in Canada from the Queen's Printer, Ottawa.
The State of Food and Agriculture, 1968, Food and

Agriculture Organization of the United Nations, Rome, 1968. pp. viii+205.

This annual report contains information on agricultural production, farm prices and incomes, trade in agricultural products, and foreign aid programs as well as data on many other features of the world situation concerning food and agriculture. Comprehensive statistical tables are included.

Fertilizers, An Annual Review of World Production, Consumption and Trade, 1966, Food and Agriculture Organization of the United Nations, Rome, 1967. pp. viii+223.

The purpose of this review is to record and analyze the production, trade, consumption and prices of fertilizers in the world as a whole and in the different countries and continents. In the Appendix tables detailed data are given for each country.

Report of the First Session of the FAO Panel of Experts on Integrated Pest Control, Food and Agriculture Organization of the United Nations, Rome, 1968: pp. iii+19.

This publication reports on the objectives and methods of the FAO's pest control programs.

STATISTICAL APPENDIX

AVERAGE PRICES OF SELECTED CANADIAN FARM COMMODITIES, VARIOUS MARKETS AND GRADES,

Commodity, grade and market	1967			1968			
	Average	July	Aug.	May	June	July	Aug.
CATTLE (weighted average prices at public stockyards)							
dollars per cwt.							
Good slaughter steers							
Toronto	27.65	27.96	28.26	26.17	27.19	27.32	28.20
Winnipeg	26.60	26.67	27.77	26.48	27.31	27.61	28.26
Calgary	26.05	25.84	26.21	25.48	26.84	26.70	27.21
Good feeder steers							
Toronto	28.70	29.50	29.50	29.45	30.00	30.06	29.99
Winnipeg	26.55	26.58	26.93	27.37	28.20	27.93	27.66
Calgary	26.40	25.94	25.98	26.65	27.29	27.05	27.11
Good and choice veal calves							
Toronto	36.15	35.14	33.63	37.63	37.20	34.56	32.70
Winnipeg	38.85	36.47	36.98	40.49	39.99	36.32	33.97
Edmonton	30.40	30.07	28.91	33.37	35.85	28.93	29.35
HOGS (weighted average prices at public stockyards, Grade A dressed)							
Toronto	30.70	30.44	30.26	28.27	30.81	32.30	34.22
Winnipeg	28.55	27.82	28.46	26.65	28.82	30.38	33.78
Calgary	27.05	26.61	26.76	24.06	26.10	27.63	30.55
LAMBS (weighted average prices at public stockyards, Good lambs)							
Toronto	26.65	33.46	29.51	43.22	37.28	34.53	27.43
Winnipeg	21.40	26.40	24.58	28.16	34.21	28.04	23.22
Calgary	20.40	22.97	21.22	27.77	28.38	24.78	22.04
FLUID MILK (f.o.b. factory)							
Halifax	6.24	6.10	6.45	6.45	6.45	6.45	6.70
Montreal	5.96	6.00	6.00	6.00	6.00	6.00	6.00
Toronto	5.98	6.10	6.10	6.15	6.15	6.15	6.15
Winnipeg	5.84	5.97	5.97	5.97	5.97	5.97	5.97
Vancouver	6.93	7.02	7.04	6.88	6.89	6.89	6.90
MANUFACTURING MILK (average farm value) ^{ad}							
Nova Scotia	3.22	3.32	3.32	3.21	3.22	—	—
New Brunswick	3.12	3.11	3.13	3.24	3.04	—	—
Quebec ^b	3.32	3.33	3.34	3.33	3.35	—	—
Ontario ^c	3.28	3.25	3.26	3.28	3.26	—	—
British Columbia	3.27	3.31	3.33	3.11	3.12	—	—
cents per lb.							
BUTTERFAT (for butter, average farm value) ^{ae}							
Prince Edward Island	67.7	67.5	68.0	67.0	66.0	—	—
Quebec ^b	64.8	64.5	64.5	65.5	65.5	—	—
Ontario ^c	61.3	61.6	61.5	61.7	61.5	—	—
Saskatchewan	62.5	62.3	62.3	62.3	61.2	—	—
British Columbia	—	—	—	—	—	—	—
EGGS (average paying prices at registered grading stations, Grade A Large)							
cents per doz.							
Halifax	36.3	29.8	37.2	31.2	29.7	34.6	40.7
St. Anselme	35.5	29.2	37.9	31.2	29.7	33.4	41.2
London	33.4	28.5	35.1	28.8	27.6	30.9	38.0
Winnipeg	26.9	24.6	29.1	23.1	23.2	26.4	31.5
Vancouver	30.2	28.5	32.4	32.5	35.0	38.5	44.0
BROILERS (average prices paid to growers No. 1 grade chicken under 5 lbs.)							
cents per lb. live							
Toronto	19.6	19.5	19.3	21.0	21.1	21.5	21.5
Edmonton	21.0	20.2	20.2	22.0	22.0	22.2	22.4
TURKEYS (average prices paid to growers, No. 1 grade, 12-20 lbs.)							
London	23.7	23.0	23.1	23.5	23.5	23.9	24.1
Edmonton	25.4	—	25.0	—	—	—	—

AVERAGE PRICE OF SELECTED CANADIAN FARM COMMODITIES, VARIOUS MARKETS AND GRADES, (Continued)

Commodity, grade and market	1967-68	1967		1968			
	Crop year Average	July	Aug.	May	June	July	Aug.
POTATOES (Can. No. 1 Table, average prices to growers)							
dollars per cwt.							
Prince Edward Island.....	1.51	1.50	1.90	2.17	2.18	2.43	2.43
New Brunswick.....	1.22	0.85	1.33	1.40	1.78	2.73	1.70
Southwestern Ontario.....	1.92	2.00	1.88	1.68	1.93	2.50	2.40
EASTERN GRAINS							
cents & eights per bu.							
Oats (Ont. No. 2 White, f.o.b. shipping points)....	85	85	85	85	85	85	81/2
Barley (Ont. good malting, f.o.b. shipping points)...	141/2	145	145	134/4	137	137	128/4
Corn (Ont. No. 2 Yellow, f.o.b. Chatham, 15% moisture, in carlots).....	130/7	154	154/6	123/5	126/4	130	131/4
Soybeans (Ont. No. 2, f.o.b. Chatham).....	278	304/7	300	272/1	269/2	269/5	270/3
WESTERN GRAINS (basis in store Fort William/Port Arthur, less freight and elevator handling charges)							
Red Spring Wheat (No. 2 Nor.)							
Winnipeg.....	179/5	190/6	188/1	179/3	180/6	180/5	181/7
Regina and Edmonton.....	176/2	187/2	184/5	175/7	177/2	177/1	178/3
Durum Wheat (No. 1 C.W.A.D.)							
Winnipeg.....	201/2	209	218/5	186/6	192/6	192/5	193/2
Regina and Edmonton.....	197/6	205/4	215/1	183/2	189/2	189/1	189/6
Feed Wheat							
Winnipeg.....	164/5	174/6	172/5	164/3	165/6	165/5	166/7
Regina and Edmonton.....	161/2	171/2	169/1	160/7	162/2	162/1	163/3
Oats (No. 1 feed)							
Winnipeg.....	82/4	79/7	82/4	82/5	82/2	81/7	76/5
Regina.....	80/4	77/7	80/4	80/5	80/2	79/7	74/5
Edmonton.....	78/4	75/7	78/4	78/5	78/2	77/7	72/5
Barley (No. 1 feed)							
Winnipeg.....	110/4	115/7	116/5	106/4	104	102/4	97/4
Regina.....	107/5	113	113/6	103/5	101	99/4	94/4
Edmonton.....	104/5	110/1	110/7	100/6	98/2	96/6	91/6
Rye (No. 2 C.W.)							
Winnipeg.....	120/3	129/4	122/7	120/1	113/3	111/6	108/1
Regina.....	116/1	126/1	119/4	116/6	110	108/3	104/6
Edmonton.....	113/6	122/7	116/2	113/4	106/6	105/1	101/4
Flaxseed (No. 1 C.W.)							
Winnipeg.....	336/6	325/2	340	344/6	341/2	347/4	337/4
Regina.....	334/3	322	336/6	341/4	338	354/2	334/2
Edmonton.....	330	318/4	333/2	338	334/4	340/6	330/6
Rapeseed (No. 1 C.W. basis in store Vancouver)	226/7	270/7	257/6	212/7	210/3	201/6	207/4

^a Since the average farm values for manufacturing milk and butterfat published by the Dominion Bureau of Statistics (D.B.S.) do not include the Federal subsidies, it is necessary to add, during the 12 months' period ended March 21, 1968, the Federal payment of \$1.21 per 100 pounds of milk testing 3.5% butterfat, of which 11 cents were retained for export aid. The net payment was made directly to producers at the equivalent rate of 31.42 cents per pound of butterfat. Similarly for 1968-69, \$1.31 (less 15 cents) per 100 pounds should be added to manufacturing milk and 37.42 cents per pound (less 1 cent) to butterfat. The 1967 yearly average figure excludes the Federal payment of 85 cents per 100 pounds (less 7.3 cents for export assistance) for the January-March period.

^b The 1967 yearly average farm values for manufacturing milk and butterfat to producers in the Province of Quebec exclude a subsidy payment of 10 cents a pound butterfat, made by the Quebec Government, for the January-March period. The policy was terminated on March 31, 1967.

^c The 1967 yearly average farm values to producers in the Province of Ontario exclude a payment, made by the Ontario Government, for the January-March period of 25 cents a 100 pounds of manufacturing milk and secondary and excess fluid milk delivered to plants, basis 3.5% butterfat. For all cream grading Special and No. 1 the payment was 10 cents a pound butterfat.

^d Beginning January 1, 1968, a new D.B.S. series for the average farm value of manufacturing milk includes all milk used for manufacturing purposes. Milk used for the manufacture of butter was previously excluded. Comparable figures are shown for 1967.

^e Beginning January 1, 1968, a new D.B.S. series shows the price of butterfat in cream for manufacturing into butter (farm-separated cream) and is not comparable with the previously published series for butterfat, which included the butterfat in milk used for manufacturing into butter. Comparable figures are shown for 1967.

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CANADIAN FARM ECONOMICS



Changes in Farm Structure and Business Size in the Red Deer Area of Alberta, 1962-67 . . . J. H. Lovering, W. L. Oddie and L. M. L. Rokosh	1
Beef Cattle Production on Farms in Central British Columbia, 1966 . . . M. M. Sorboe	8
Death of Farm Animals in Canada . . . W. Y. Yang	16
Some Observations on the Long Term Prospects of the Canadian Peach Industry . . . J. R. Burns	20
Pear Production in Canada . . . Raziuddin M. Siddiqui	29
Policy and Administration of Public Lands in Manitoba with Particular Reference to Agriculture . . T. F. Joyce	35
Policy and Program Developments	40
Publications	41
Statistical Appendix	42

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CANADIAN FARM ECONOMICS

CHANGES IN FARM STRUCTURE AND BUSINESS SIZE IN THE RED DEER AREA OF ALBERTA, 1962-67

J. H. Lovering, W. L. Oddie and L. M. L. Rokosh

Continual change in agricultural markets and technology requires corresponding adjustments in farm businesses if they are to yield adequate levels of net income. Because of the relatively inelastic demand for farm products and the development and application of output-increasing technology, prices of farm products have declined relative to prices of farm inputs. Much of the new technology constitutes a replacement of labor by capital investment in equipment that requires large volumes of output for efficient use. Increasing labor costs, influenced by the non-agricultural sector, have tended to ensure the replacement of labor by capital. For these reasons one of the main farm adjustments is toward larger businesses which use equipment more efficiently and which have volumes of output sufficient to yield higher returns to labor although the net income per unit of product is small.

Adjustments in farm business size are not easily made because they frequently require additional capital and skill. On this basis, general expectations lead to the hypothesis that adjustments in size tend to lag behind those needed for the best use of resources employed in agriculture. This hypothesis forms the basis of a research study (1) with the following objectives: (1) to examine the nature and extent of changes in farm business size and structure, (2) to determine whether or not existing businesses are of sufficient size to make good use of available resources, and (3) to estimate whether or not within a reasonable length of time the observed rate of change is sufficient to close any "efficiency gaps" that may exist. The present article is restricted to the first of these objectives. The other two objectives will be investigated as the study progresses.

In the Parkbelt of the Prairie Provinces, changes in farm business size have been taking place slowly. Recent census data indicate, however, that this rate of change is increasing and suggest, therefore, the need for an appraisal of present resource use efficiency as well as the establishment of normative rates of

farm business growth. The Red Deer area of the Alberta Parkbelt was selected as an investigation site (2) for the following reasons: (1) 70 detailed farm business records for a wide range of farm sizes in 1962 were available and in 1967 would permit the observation of changes over a five-year period for the same farm firms; (2) the adjustments and rate of change were likely to be significant because the high quality of the land resources would make additional investment in the farm business possible; and (3) the area had a substantial number of large, effectively-operated farms which would aid in the establishment of standards of size and efficiency applicable to Parkbelt farms.

STUDY AREA

The farms selected for study lie within the Black Soil Zone. Soils are typically well-drained loams developed on till and characterized by an undulating to gently rolling topography with few stones. A small number of farms have soils developed on alluvial lacustrine material. The soil rating on nearly all study farms is 7 on a scale that ranges from 1, the lowest quality, to 8, the highest quality (3).

Penhold, Alberta, (4) is just west of the study area. At 28°F the frost-free period there is well in excess of the number of days established as necessary for maturing wheat at Lacombe, Alberta, which is about eight miles from Red Deer County (5). At 32°F, however, the frost-free period at Penhold (6) is considerably shorter than that required for maturing wheat at Lacombe. A recent study (7) of temperatures occurring at various topographical positions indicates that on clear nights temperature variations of 9°F are common where differences in elevation are as little as 100 feet and where the sites are separated by distances of less than one mile. Such data suggest that wheat production in some parts of the study area, particularly those to which cold air can drain, is attended by a considerable risk of frost damage.

This may be one of several factors that influence farmers to sow relatively little wheat and to concentrate more on barley and oats.

In the period from May to August inclusive the study area receives almost 60 per cent of its annual precipitation (4). This percentage is higher than that in most areas of Alberta and Saskatchewan for the same period. The yearly variance in growing season precipitation is relatively small. For 12 years of the 20 year period, 1947-1966, the May to August precipitation was from 9 to 11 inches, for 5 of the years it was more than 11 inches, and for 3 of the years it was from 7 to 9 inches. Central Alberta is considered to be an area of high hail incidence (8), but few of the sample farmers carried hail insurance or indicated that hail was a source of severe loss in their operations.

The study area lies within Red Deer County which is midway between the major market centres of Calgary and Edmonton. It is served by well-developed transportation facilities. In consequence feeder cattle, livestock feeds, and other farm services are readily available. A 1961 classification of agricultural areas of Canada according to main source of agricultural income (9) classed Red Deer County as "all livestock". This means that 70 per cent or more of the commercial census farms received most of their income from sales of livestock and livestock products. The same classification indicates that 60 to 70 per cent of the land in commercial farms is improved, that the total improved area per farm was between

200 and 350 acres, and that the number of all cattle per farm was between 40 and 50 head. A study on a sample of 50 farms in 1962 (10) indicated barley was the main cereal crop, occupying about 30 per cent of the improved land, followed by oats with about 12 per cent and wheat at about the 5 per cent level. Tame hay and tame pasture were much more important than in other Parkland areas and accounted for more than a quarter of the improved land. Summer-fallow amounted to a little less than 20 per cent of the land. This is quite different from the usual Prairie grain farm rotation which leaves one-third to one-half of the crop land in fallow. For the same 50 farm sample, income from livestock products accounted for two-thirds to three-quarters of the total farm receipts with cash crop sales providing about one-quarter of the receipts.

CHANGES IN FARM BUSINESS SIZE

The changes in the amount and direction of farm business size in the 1962-67 period are shown in Table 1. For study purposes a farm was considered to have changed in size over the five-year period if there was an increase or decrease in productive man work units, PMWU's, (11) of more than 10 per cent. Farms with changes of 10 per cent or less in either direction were considered to be unchanged.

The change in size is measured on the basis of the 1962 records. Farms with less than 161 cultivated

TABLE 1—CHANGES IN FARM BUSINESS SIZE IN THE RED DEER AREA OF ALBERTA, 1962 TO 1967, BY CULTIVATED ACREAGE AND DIRECTION OF CHANGE

Measure of Size	Cultivated Acreage in 1962					Direction of Change		
	Less than 161	161 to 320	321 to 480	More than 480	All Farms	Increased	Unchanged	Decreased
Per cent.....	11	37	26	26	100	45	32	23
Mean cultivated acreage, 1962...	136	234	413	659	378	432	346	326
Mean cultivated acreage, 1967...	143	270	449	762	428	528	369	325
Per cent change.....	5.1	15.3	8.7	15.6	13.2	22.2	6.6	-0.3
PMWU, 1962 ^a	148	283	435	704	415	449	410	358
PMWU, 1967.....	140	321	559	917	515	708	408	291
Per cent change.....	-5.4	13.4	28.5	30.3	24.1	57.7	-0.5	-18.7
Man equivalent, 1962.....	1.10	1.13	1.59	1.64	1.40	1.56	1.25	1.20
Man equivalent, 1967.....	1.00	1.09	1.63	1.99	1.45	1.71	1.26	1.19
Per cent change.....	-9.1	-3.5	2.5	21.3	3.6	9.6	0.8	-0.8
Total farm investment (dollars), 1962 ^b	28,699	43,140	64,855	121,839	67,659	80,854	55,787	56,873
Total farm investment (dollars), 1967 ^c	25,794	46,735	82,623	143,253	78,857	102,311	63,276	52,184
Per cent change.....	-10.1	8.3	27.4	17.6	16.6	26.5	13.4	-8.2
Total acreage, 1962.....	222	325	512	858	501	575	435	427
Total acreage, 1967.....	224	365	551	951	550	668	453	427
Per cent change.....	0.9	12.3	7.6	10.8	9.8	16.2	4.1	0

^aPMWU—productive man work unit.

^bTotal investment in 1962 for the farms that ceased operation in the ensuing five years was \$42,194, and there were 289 work units per farm.

^cDeflated to the level of 1962.

TABLE 2—PERCENTAGE DISTRIBUTION OF BUSINESS BY DIRECTION OF CHANGE AND SIZE OF FARM, RED DEER AREA OF ALBERTA

Size of Farms Cultivated Acreage in 1962	Direction of Change				Total
	Increased	Unchanged	Decreased	Ceased	
	per cent				
Less than 161.....	9	18	18	55	100
161 to 320.....	30	35	25	10	100
321 to 480.....	47	20	20	13	100
More than 480.....	58	25	9	8	100

acres in 1962 increased from an average of 136 cultivated acres to an average of 143 cultivated acres in 1967. In the sample of 70 farms nearly one-third, 32 per cent, did not change over the five-year period. Forty-five per cent of the farms in the sample increased from a 1962 average of 432 cultivated acres per farm to a 1967 average of 528 cultivated acres per farm, an increase of 22 per cent. In just under one-quarter of the sample farms, 23 per cent, the average size of farm decreased from 1962 to 1967, but it was a minimal decrease of 1 per cent.

It may be inferred from Table 1 that the larger farms had the greatest rate of growth. Farms of less than 161 cultivated acres decreased as measured by PMWU's, man equivalents, and total investment. The negative growth rate in farms of this size can be accounted for in part by the large number of older operators.

It is mainly the larger farm businesses that have increased in size and the proportion of farm businesses

that decreased or ceased operation is highest in the smaller size classes (Table 2). The relative importance of age to farm business growth is shown in Table 3. Although somewhat higher proportions of operators 40 years or younger increased their farm business sizes compared with those who were 41 to 60 years of age, only 12 per cent of the operators over 60 years increased their farm business size.

TABLE 3—PERCENTAGE DISTRIBUTION OF BUSINESSES BY AGE OF OPERATOR IN 1962 ACCORDING TO DIRECTION OF CHANGE, RED DEER AREA OF ALBERTA

Age	Direction of Change		
	Increased	Unchanged	Decreased
Years	per cent		
21 to 30.....	67	—	33
31 to 40.....	75	—	25
41 to 50.....	44	37	19
51 to 60.....	50	31	19
61 and more.....	12	50	38

TABLE 4—CHANGES IN THE COMBINATION OF FARM ENTERPRISES, RED DEER AREA OF ALBERTA, BY CULTIVATED ACREAGE AND DIRECTION OF CHANGE, 1962 TO 1967

	Cultivated Acreage				All Farms	Direction of Change		
	Less than 161	161 to 320	321 to 480	More than 480		Increased	Unchanged	Decreased
Per cent of total PMWU on crops, 1962.....	38.3	44.5	51.0	53.6	50.2	50.5	51.2	46.5
Per cent of total PMWU on crops, 1967.....	54.2	44.7	45.5	52.6	48.8	43.8	53.2	63.9
Per cent of total PMWU on livestock, 1962.....	61.7	55.5	49.0	46.4	49.8	49.5	48.8	53.5
Per cent of total PMWU on livestock, 1967.....	45.8	55.3	54.5	47.4	51.2	56.2	46.8	36.1
Wheat acreage, 1962.....	10	4	16	38	16	18.8	12.1	17.9
Wheat acreage, 1967.....	—	7	33	36	20	22.0	23.8	12.3
Per cent change.....	— 100	75	106	— 5.3	25	17.0	96.6	—42.4
Oats acreage, 1962.....	19	34	72	72	52	65.7	43.0	37.4
Oats acreage, 1967.....	8	23	21	63	31	45.9	20.6	16.3
Per cent change.....	—57.8	—32.3	—70.8	—12.5	—40.4	—30.1	—52.0	—56.9
Barley acreage, 1962.....	35	82	126	190	116	129.1	110.7	96.8
Barley acreage, 1967.....	104	128	212	378	211	257.5	167.3	171.1
Per cent change.....	197.1	56.0	68.3	98.9	81.9	99.4	51.1	76.7
Tame pasture and hay acreage, 1962.....	28	44	103	183	91	105.4	95.3	63.6
Tame pasture and hay acreage, 1967.....	11	47	103	125	77	101.4	81.3	28.8
Per cent change.....	—60.7	6.81	0	—31.2	—15.3	— 3.8	—14.6	—54.7
Summerfallow acreage, 1962.....	29	38	84	120	70	81.9	47.5	72.2
Summerfallow acreage, 1967.....	16	36	46	76	47	49.2	44.1	44.9
Per cent change.....	—44.8	— 5.3	—45.2	—36.7	—32.8	—39.9	— 7.2	—37.8

CHANGES IN ENTERPRISE COMBINATION

Farmers in the Red Deer area also changed their combination of enterprises. On both farms of less than 161 cultivated acres and those that decreased in size, livestock have declined considerably in importance when taken as a percentage of total PMWU's used for livestock. Livestock have, however, become more significant on farms having 321 to 480 cultivated acres and on those that increased in size (Table 4). The decline in livestock on farms of less than 161 cultivated acres and on farms that decreased in size is consistent with the advancing ages of their operators. For the sample as a whole as well as for the other size-change classes, the balance of PMWU's between crops and livestock has remained about the same.

TABLE 5—PERCENTAGE CHANGE IN PMWU ON CROPS AND LIVESTOCK BY DIRECTION OF CHANGE, 1962 TO 1967, RED DEER AREA OF ALBERTA

Enterprise	Direction of Change of PMWU's		
	Increased	Unchanged	Decreased
	per cent		
Crops.....	37	3	12
Livestock.....	79	-4	-45

Increased livestock production was an important part of business growth (Table 5). Of the farm businesses that expanded in size, the change in PMWU's for livestock increased from 222 to 398, a rise of 79 per cent. Farm businesses that contracted in size showed a decline in livestock PMWU's from 192 to 105, a decrease of 45 per cent. On the other hand crops showed a positive change in both the increased and decreased classes, 37 per cent and 12 per cent respectively.

In a consideration of crop enterprises, decreases are shown in oats, hay, and summerfallow acreages. On the other hand barley acreage has increased substantially. This crop is suitable to the area in terms of its feed value for livestock and in terms of its climatic requirements. Skill in managing barley appears to have reached a high level in the Red Deer area and continuous cropping with high yields and low incidence of disease is common.

CHANGES IN THE DISTRIBUTION OF ASSETS AND MEASURES OF EFFICIENCY

Changes occurred in the proportion of total investment in various types of assets and in labor efficiency (Table 6). A comparison of Tables 1 and 6

TABLE 6—CHANGES IN THE DISTRIBUTION OF ASSETS, AND MEASURES OF CAPITAL AND LABOR EFFICIENCY ON FARMS IN THE RED DEER AREA OF ALBERTA, 1962 TO 1967, BY CULTIVATED ACREAGE, AND DIRECTION OF CHANGE

	Cultivated Acreage				All Farms	Direction of Change		
	Less than 161	161 to 320	321 to 480	More than 480		Increased	Unchanged	Decreased
Per cent of total assets in real estate, 1962.....	60.9	66.7	61.7	60.2	62.2	61.2	62.3	62.9
Per cent of total assets in real estate, 1967.....	68.7	68.5	68.3	59.9	64.5	61.9	67.3	70.0
Per cent of total assets in livestock, 1962.....	13.5	13.1	13.7	15.0	14.1	14.2	14.5	13.3
Per cent of total assets in livestock, 1967.....	8.5	9.8	10.5	13.4	11.6	13.1	11.4	6.5
Per cent of total assets in equipment, 1962.....	18.3	15.5	20.8	17.7	17.9	18.1	17.3	18.1
Per cent of total assets in equipment, 1967.....	15.9	16.3	15.0	19.8	17.5	18.7	15.3	17.2
Liabilities as a per cent of assets, 1962.....	6.2	10.1	10.7	5.0	8.1	7.93	10.46	3.95
Liabilities as a per cent of assets, 1967.....	9.2	12.5	9.8	13.5	12.1	13.38	9.86	11.51
Value of equipment/PMWU, 1962.....	36.88	23.82	30.96	31.84	29.48	32.52	23.60	28.73
Value of equipment/PMWU, 1967.....	40.43	32.72	30.48	40.48	35.85	35.81	25.73	42.73
Value of equipment/cultivated acre, 1962.....	40.24	28.74	31.79	32.73	31.81	33.78	27.97	31.57
Value of equipment/cultivated acre, 1967.....	39.64	38.82	37.93	48.75	43.12	48.02	35.87	38.23
PMWU/man equivalent, 1962.....	140	249	273	431	303	288	328	298
PMWU/man equivalent, 1967.....	140	293	344	461	355	414	324	245
Cultivated acres/man equivalent, 1962.....	128	207	259	404	276	278	278	271
Cultivated acres/man equivalent, 1967.....	143	247	277	383	295	309	292	273

*The corresponding figure for 1962 for the farms that ceased operation in the ensuing 5 years was 6.45 per cent.

†1967 equipment values deflated to 1962.

TABLE 7—PERCENTAGE DISTRIBUTION OF BUSINESSES BY TOTAL INVESTMENT CLASSES IN 1962 AND DIRECTION OF CHANGE, RED DEER AREA OF ALBERTA

Total Investment, 1962	Direction of Change			
	Increased	Unchanged	Decreased	Ceased
dollars	per cent			
40,000 and less.....	14	21	18	47
40,001 to 65,000.....	35	23	14	28
65,001 to 90,000.....	—	29	14	57
90,001 to 115,000.....	67	—	33	—
115,001 to 140,000.....	33	67	—	—
140,001 and more.....	100	—	—	—

reveals that although liabilities as a proportion of total farm assets increased, they did not increase as fast as owner-equity either in percentage or in absolute terms. There is no large shift in the proportions of total farm investment in various items for the sample as a whole. There is, however, considerably more variation between size classes. Data in Table 6 support the expectation that equipment on smaller farms becomes a smaller part of total investment as that equipment becomes older and little replacement occurs. A proportionately larger part of the total investment is found in real estate. It might also be expected that liabilities would stay the same or decrease on the small farms; instead, they increased by 3 per cent of total assets. Distribution of assets has not changed very much by size of farm and this is particularly true for the larger farms. Farms of 321 to 480 acres in size show a 6.6 per cent increase in investment in real estate and a 5.8 per cent decrease in equipment. Investment in livestock as a percentage of total investment has declined in each size class.

Value of equipment per cultivated acre has risen substantially in each size class except for farms with less than 161 cultivated acres. The value of equipment per PMWU has grown in all but the 321 to 480 size class which experienced a small decline of 0.48 per cent. There has been an improvement in efficiency which is indicated by the PMWU's per man-equivalent and cultivated acres per man equivalent being substantially greater on farms of the three top size classes and on the farms that became larger or remained unchanged.

The distribution of businesses in total investment classes by direction of change is shown in Table 7. Of those farmers with a total investment of \$40,000 and less in 1962, 47 per cent had ceased farming by 1967, 21 per cent were unchanged and only 14 per cent increased in size. Of operators with an investment of \$115,000 to \$140,000 in 1962, 33 per cent grew in size by 1967 and 67 per cent were unchanged.

All farms having a value of more than \$140,000 expanded in size.

The above analysis establishes the following conclusions: (1) that the larger businesses grew faster, (2) that increased livestock relative to crops was a significant part of expansion, (3) that barley became increasingly more important while summerfallow acreages declined, (4) that rapid size growth did not raise liability levels, (5) that livestock investment declined relative to real estate and equipment investments, (6) that the value of equipment per cultivated acre and per work unit increased, and (7) that work units and cultivated acres per man equivalent improved in the larger and developing businesses.

FUTURE DISTRIBUTION OF BUSINESS SIZE

The changes in farm business sizes observed in the period 1962 to 1967 are projected for three additional five-year periods using the Markov Chain process (12), (Table 8). The distribution of business sizes shown for 1972, 1977 and 1982 could occur only if the pattern of change is unaltered. It is, nevertheless, likely that future size distributions will bear some resemblance to the ones shown. Although 81 per cent of the farm businesses were under 600 PMWU's in 1962, in 1967 just 62 per cent were below that size. The projected estimate is that by 1982 only 25 per cent of the farm business sizes will be less than 600 PMWU's.

TABLE 8—A PROJECTION OF FARM BUSINESS SIZE, MEASURED BY PMWU'S IN THE RED DEER AREA OF ALBERTA, 1962 TO 1982

PMWU	1962	1967	1972	1977	1982
	per cent of farms				
Less than 400.....	62	43	32	23	17
401 to 600.....	19	19	15	11	8
601 to 800.....	11	19	19	17	13
801 and more.....	8	19	34	49	62
Total.....	100	100	100	100	100

TABLE 9—A COMPARISON OF FARM CHARACTERISTICS IN THE MUNICIPALITIES OF RED DEER, ALBERTA, ST. PETER, SASKATCHEWAN AND MINTO, MANITOBA, 1961 AND 1966

Characteristics	Red Deer		St. Peter		Minto	
	1961	1966	1961	1966	1961	1966
Total acres per farm.....	422	452	485	523	404	451
Per cent change.....		6.6		7.8		11.6
Improved acres per farm.....	279	327	413	459	293	329
Per cent change.....		17.2		11.1		12.2
Per cent of improved land in:						
			per cent			
Wheat.....	7	7	35	45	34	42
Oats.....	13	8	11	6	8	7
Barley.....	32	38	5	7	7	6
Flax.....	—	—	3	1	2	1
Rape.....	1	5	4	3	—	—
Mixed Grain.....	2	2	2	2	1	—
Hay.....	16	15	2	1	7	5
Tame Pasture.....	9	11	3	3	3	4
Summerfallow.....	17	11	34	31	36	32
Other.....	3	3	1	1	2	3
			number of animals			
Cattle per farm.....	46	59	12	13	19	20
Pigs per farm.....	29	29	28	28	8	8

Source: Dominion Bureau of Statistics, *Census of Agriculture*, 1961 and 1966.

BUSINESS GROWTH IN OTHER PARTS OF THE PARKBELT

The current study relates to the Red Deer area but the larger concern is with resource efficiency and farm adjustment in the entire Parkbelt of the Prairie Provinces. This is so because farm size adjustments in the Parkbelt area have occurred at a relatively slow rate compared with corresponding changes in the Prairie area. The Red Deer data examined thus far reveal that some changes have occurred, i.e., that the larger businesses grew faster, that livestock increased faster relative to crops in the expansion, that barley has become more important and that fallow acreages have decreased.

A natural question to ask is whether or not similar adjustments have occurred in other parts of the Parkbelt. To provide a wider indication of changes Red Deer County is compared with the Rural Municipality of St. Peter, situated about 5 miles east of Humboldt, Saskatchewan, and the Rural Municipality of Minto, located about 40 miles north of Brandon, Manitoba. All three municipal units have high productivity black soils. The normal precipitation from April 1 to August 31 is 11.46 inches at Penhold, 8.41 inches at Humboldt, and 12.05 inches at Brandon (13).

Census data for 1961 and 1966 are used for the comparison of farm business growth (14), (Table 9). Using acres of improved land as a measure, farm businesses in the Red Deer area increased in size more rapidly than in the other two areas. Farm

businesses in Red Deer County also grew faster in terms of a higher proportion of land in crop and a greater number of cattle per farm. Wheat is the main crop in the R. M. of St. Peter and the R. M. of Minto while barley is the most important crop in Red Deer County. The average farm acreage of the main crop in each area increased substantially over the five-year period.

The reasons for the differences in resource combination and growth rates between farms in the Red Deer area and those in the St. Peter and Minto areas have yet to be defined. It is, however, obvious that there is considerable variation in the adjustments that are taking place. Both desirable and attainable growth rates change from one area to another as the result of varying cultural and physical influences; therefore it is necessary to study different areas in some detail. Development of efficiency and size standards for Red Deer area farms is now under way. These standards will be used as guides to appraise present resource use efficiency. Estimates of growth rates necessary to close any existing "efficiency gaps" will be made and compared with those observed. In this way the adequacy of observed growth rates can be judged and policy implications made explicit. Insofar as standards for the Red Deer area are concerned, these may be applicable to other Parkbelt areas. Such standards may be suitable but it is probable that additional standards specific for other areas and differing physical resource conditions will be required.

FOOTNOTES AND REFERENCES

- (1) Started in 1967 by the Prairie Economics Research Centre under the following project title: "An Examination of the Extent, Need and Process of Farm Business Enlargement in the Parkland Areas of the Prairies".
- (2) Specifically the study site was located within Townships 33 to 38 of Ranges 25 to 29, West of the Fourth Meridian.
- (3) W. E. Bowser, *et al*: Soil Survey of Red Deer Sheet, Report No. 16 of the Alberta Soil Survey, Edmonton, 1951.
- (4) Department of Transport, Meteorological Branch: *Monthly Record, Meteorological Observations in Canada*, Toronto, 1947-1966.
- (5) Canada Department of Agriculture, Research Branch: "Lacombe Research Hi-Lites", mimeo, Lacombe, 1961-1965.
- (6) C. C. Boughner, *et al*: *Climatic Summaries for Selected Meteorological Stations in Canada, Vol. III, Frost Data*, Toronto, 1956.
- (7) R. W. Longley and M. Louis-Byne: *Frost Hollows in West Central Alberta*, Department of Transport, Meteorological Branch, CIR 4532, TEC 639, Toronto, 1967.
- (8) Alberta Department of Agriculture: *Alberta Farm Guide*, Edmonton, 1967.
- (9) "Predominant Types of Commercial Farms in Canada — 1961". One of a series of maps showing "Broad Characteristics of Agriculture in Canada", by the Economics Branch, Canada Department of Agriculture, Ottawa.
- (10) Unpublished data on a Study of Farm Organization on 50 Farms on High Productivity Black Soils in the Red Deer District, 1962, by Economics Branch, Canada Department of Agriculture.
- (11) A productive man work unit (PMWU) is the amount of directly productive work accomplished by a typical operator using typical production methods in a 10-hour day. A man equivalent is an amount of labour equivalent to 12 months of adult male labour.
- (12) The Markov process can be used to evaluate changes in the size distribution of firms within an industry. The general operation of this model consists of observing movement of firms between specific size classes over specific time periods and generating an equilibrium size distribution of firms which would be expected to result if the type of activity initially observed continued indefinitely. The appropriateness of the assumptions — namely, that the determinants of firm growth may be represented by a system of probabilities of firm movement from one size class to another — is unknown.
- (13) "Daily Weather Map", Meteorological Branch, Canada Department of Transport, Winnipeg.
- (14) Dominion Bureau of Statistics: *Census of Canada*, Agriculture, Ottawa, 1961 and 1966.

BEEF CATTLE PRODUCTION ON FARMS IN CENTRAL BRITISH COLUMBIA, 1966

M. M. Sorboe

A study of beef farms in Central British Columbia for the farm business year ending March 31, 1967 was undertaken as an adjunct to the general economic survey of beef cattle production in the province (1). The study area comprised part of Census Division 8, specifically that part extending in a westerly direction from Prince George to Hazelton.

The purpose of the study was to obtain primary data on the production of beef cattle in the area. It was designed to provide specific information on the following:

- (1) General characteristics of the beef farm organization.
- (2) Capital investment, costs and returns associated with production of beef cattle.
- (3) Changes in the structure of beef farms and in the financial status of beef producers since 1963 (2).
- (4) Marketing and production potential for beef cattle on full-time farms in the area.

Physical Characteristics of the Region

In this region farming is not continuous, but occurs in "pockets" where the productivity of land and marketing conditions are conducive to particular types of farm production. For example, a concentration of dairy farms is found in the Bulkley Valley at Smithers. Vanderhoof is recognized for its production of cereal grains for local use and small cattle ranches are found in the "Lakes District", south of Burns Lake.

With these few exceptions of area specialization, mixed farming is a characteristic of the region. Dairy products, beef cattle, grain, and hay constitute the primary sources of cash farm income.

Generally, the topography of the farm area is undulating to gently rolling. The elevation varies from 1,860 feet above sea level at Prince George to 2,500 feet in the "Lakes District". In the Bulkley Valley the elevation is 2,200 feet.

Average precipitation is 23 inches at Prince George and about 18 inches at Burns Lake and Smithers. Vanderhoof has the lowest average annual precipitation (13 inches) in the region.

Frost-free periods are short for all the districts, being 68 days for Prince George, 40 days for Vanderhoof and about 60 days at Burns Lake. However, because forage crops tend to resist damage from frost

to a temperature of 26°F, the growing season for these crops is extended to about 160 days.

Beef cattle production was emphasized on many farms throughout the area but the greatest concentration of small ranch-type operations was found in the "Lakes District", south of Burns Lake. Twelve records were obtained from ranchers in the Burns Lake area and nine records were completed for beef farmers located in the districts of Smithers, Telkwa, Vanderhoof and Prince George.

RESULTS OF THE STUDY

Farm Capital

The average beef farm capital investment was \$76,545 or \$930 an animal unit of livestock. Total capital ranged from \$38,583 for the smallest farm to \$137,163 for the largest of these full-time operations.

The high labor income group had an average capital investment of only \$66,699 per farm compared with \$85,495 for the low income group (Table 1).

Distribution of farm capital for all farms was 60 per cent in real estate, 23 per cent in livestock, 16 per cent in equipment and 1 per cent in crop and other inventories.

Land values derived from farmers' estimates were \$105 and \$14 per acre, respectively, for improved and unimproved land.

Financial Summary

The average operator's labor income did not indicate that this type of enterprise was a profitable one for the region in the year of the study. Only 4 of the 21 beef farms under review showed a positive income to the operator for his labor and management. The average for the group was -\$2,395 and ranged from \$1,520 for the most efficient operation to -\$8,913 for the least profitable farm (Tables 1 and 2).

Current receipts amounted to \$10,325 per farm with cattle sales contributing 80 per cent of the total. Farm forest product sales which averaged \$387 for the group reflected the substantial incomes obtained from that source by only 3 operators. These 3 operators were in the high income group and had an average income from the sale of forest products exceeding \$2,000.

TABLE 1—AVERAGE FARM CAPITAL, 21 BEEF FARMS, CENTRAL BRITISH COLUMBIA, 1966

	Operator's Labor Income		All Farms
	High ^a	Low ^b	
Number of farms.....	10	11	21
Size in animal units.....	78	86	82
	dollars per farm		
Improved land.....	22,266	28,979	25,783
Unimproved land.....	9,100	11,181	10,190
House.....	4,144	6,725	5,495
Other buildings.....	3,387	5,893	4,700
Total real estate.....	38,897	52,778	46,168
Livestock.....	15,277	19,184	17,323
Equipment.....	11,995	12,706	12,368
Crop, feed, supplies.....	530	827	686
Total farm capital.....	66,699	85,495	76,545
Total farm capital per animal unit.....	854	993	930

^a Range in operators' labor incomes \$1,520 to —\$1,556.^b Range in operators' labor incomes —\$2,088 to —\$8,913.

TABLE 2—FINANCIAL SUMMARY, 21 BEEF FARMS, CENTRAL BRITISH COLUMBIA, 1966

	Operator's Labor Income		All Farms
	High ^a	Low ^b	
	dollars per farm		
Current receipts			
Cattle sales.....	8,764	7,602	8,156
Other livestock sales.....	100	93	95
Crop sales.....	739	683	709
Custom work receipts.....	252	691	482
Forest product sales.....	630	165	387
Other current receipts.....	671	336	496
Total current receipts.....	11,156	9,570	10,325
Total capital receipts.....	1,506	328	889
Net inventory increase.....	3,659	—	1,075
Total farm receipts.....	16,321	9,898	12,289
Current expenses			
Real estate expenses ^c	484	864	684
Cattle purchases.....	1,807	336	1,036
Feed purchases.....	699	532	612
Other livestock expenses.....	104	197	152
Crop expenses.....	679	592	633
Equipment expenses.....	1,414	1,384	1,398
Hired labor.....	512	460	485
Other current expense.....	206	251	230
Total current expenses.....	5,905	4,616	5,230
Total capital expenses.....	5,445	2,021	3,652
Net inventory decrease.....	—	1,276	—
Total farm expenses.....	11,350	7,913	8,882
Family farm income.....	4,971	1,985	3,407
Less—Interest on capital.....	4,002	5,129	4,593
—Unpaid family labor.....	1,110	1,299	1,209
Operator's labor income.....	—141	—4,443	—2,395
Plus: Perquisites—Farm produce.....	290	386	340
—Use of house.....	414	672	550
Operator's labor earnings.....	563	—3,385	—1,505
Operator's labor income per animal unit.....	—2	—52	—29
Non-farm income, ^d	1,272	2,667	2,003

^a Range in operators' labor incomes \$1,520 to —\$1,556.^b Range in operators' labor incomes —\$2,088 to —\$8,913.^c Includes taxes, rent, fire insurance and repairs to buildings and fences.^d Includes income from non-farm work, investment income, pensions and allowances, etc.

During the year, the high income group had increases in land, buildings, livestock, and equipment investment, but the low income farmers had a net decrease in livestock and to a lesser extent in building inventory values. The livestock inventory change was an increase of \$658 for the high income group and a decrease of \$2,025 for the low income operators, on an average per farm. For all the farms surveyed, however, the average net inventory change of combined assets was positive.

Interest at 6 per cent on the average capital investment equaled \$4,593, an amount exceeding the returns to the operator and family for labor and capital (family farm income) by almost \$1,200 per farm. The value of labor contributed by family members was calculated at a rate of \$1.50 an hour or at \$200 per month depending on the duration of the work period.

Non-Farm Income

The recent rapid development of resources and expansion of industries in Central British Columbia has increased the demand for labor in non-farm

activities. Beef farm operations require a minimum of labor except for short seasonal periods and therefore many farms are to a great extent operated by other members of the family while the owner engages in non-farm pursuits. More than half of this group of farmers earned substantial incomes from non-farm sources such as logging and milling, guiding, bus driving, teaching and other occupations. The average non-farm income was \$2,003 for all farms but the low income group had more than twice as much as the high income farms by comparison (Table 2).

Farm Loans and Liabilities

Average capital liabilities of beef farmers increased slightly during the year from \$9,888 to \$10,520 per farm (Table 3).

The proportion of long-term debts to total capital was about 13 per cent and the average rate of interest paid on borrowed money was 5.5 per cent. About 85 per cent of the total outstanding debts of beef farmers consisted of borrowings from the Farm Credit Corporation, Farm Improvement Loans Act and the Veterans Land Act.

TABLE 3—AVERAGE FARM LIABILITIES, 21 BEEF FARMS, CENTRAL BRITISH COLUMBIA, 1966

	Operator's Labor Income		All Farms
	High ^a	Low ^b	
	dollars per farm		
Owing April 1, 1966.....	9,495	10,246	9,888
Owing March 31, 1967.....	11,305	9,806	10,520
Net increase in debt.....	1,810	—	632
Net decrease in debt.....	—	440	—
Interest paid on debt.....	561	546	553

^a Range in operators' labor incomes \$1,520 to —\$1,556.

^b Range in operators' labor incomes of —\$2,088 to —\$8,913.

TABLE 4—AVERAGE LAND USE, 21 BEEF FARMS, CENTRAL BRITISH COLUMBIA, 1966

	Operator's Labor Income		All Farms
	High ^a	Low ^b	
	acres per farm		
Hay and silage.....			
Grain.....	27	13	19
Alfalfa.....	—	5	3
Grass and mixed.....	164	187	176
Grain.....	19	18	18
Other improved land.....	30	63	48
Total improved land.....	240	286	264
Grass and meadow.....	332	367	350
Bush and timber.....	821	1,182	1,010
Waste.....	121	19	68
Total unimproved land.....	1,274	1,568	1,428
Total land operated.....	1,514	1,854	1,692

^a Range in operators' labor incomes \$1,520 to —\$1,556.

^b Range in operators' labor incomes —\$2,088 to —\$8,913.

Land Use, Crops and Crop Yields

At the beginning of the study year, beef farmers operated an average of 264 acres of improved and 1,428 acres of unimproved land (Table 4). This included rented land of about 24 improved and 710 unimproved acres per operation.

The total acreage amounted to 20.6 acres an animal unit but a large part of the unimproved acreage had little, if any, grazing capacity. Exclusion of the timber and waste land reduced the area to about 7.5 acres of productive land per unit of livestock.

Forage, including hay and silage, was the main crop grown and utilized 198 acres (75 per cent of the improved land) per farm. Oats, barley and wheat were grown on an average of 18 acres per farm.

The average yield was .96 tons of harvested forage per cropped acre. Threshed grains (including wheat, oats, barley and mixed grain) averaged .75 tons per acre.

Livestock

Beef farmers in the area had a total of 82.3 animal units per farm (3). This included 78.9 units of beef cattle and 3.4 units of other livestock. Most of the farmers had two or three head of saddle stock.

Table 5 shows the number of bred cows and heifers at the beginning of the year and the number of calves born. The calf crop of 81.7 per cent on an average for all farms was favorably influenced by the high birth rates obtained by several operators in the upper income group.

Beef farmers fed an equivalent of 2.6 tons of hay an animal unit during a feeding period of about 200 days. They appeared to be nearly self-sufficient in forage production although there was little carry-over of hay and a few farmers purchased small quantities in the spring to carry their stock through the feeding period.

About a third of the operators bought substantial quantities of prepared feeds such as fortified beef

TABLE 5—AVERAGE NUMBER OF CATTLE, APRIL 1, 1966 AND NUMBER OF CALVES BORN, 21 BEEF FARMS, CENTRAL BRITISH COLUMBIA, 1966

	Operator's Labor Income		All Farms
	High ^a	Low ^b	
	number		
Breeding stock.....	53	66	60
Steers—2 years and over.....	4	1	3
Yearling steers and heifers.....	38	37	37
Calves born 1966.....	47	51	49
Bulls.....	2	2	2
Total cattle.....	144	157	151
Cows per bull.....	26	33	30
	per cent		
Calf crop.....	88.7	77.3	81.7
Stock losses.....	2.2	2.6	2.4
Proportion of cows to herd.....	37	42	40

^a Range in operators' labor incomes \$1,520 to —\$1,556.

^b Range in operators' labor incomes —\$2,088 to —\$8,913.

TABLE 6—NUMBER OF CATTLE SOLD, BY CLASS OF ANIMAL, 21 BEEF FARMS, CENTRAL BRITISH COLUMBIA, 1966

	Operator's Labor Income		All Farms
	High ^a	Low ^b	
	number sold per farm		
Cows.....	9.0	12.3	10.7
Steers 2 years.....	3.7	1.4	2.5
1 year.....	24.2	18.3	21.1
Heifers.....	12.2	10.3	11.2
Calves.....	1.7	14.2	8.3
Bulls.....	0.5	0.7	0.6
Total.....	51.3	57.2	54.4

^a Range in operators' labor incomes \$1,520 to —\$1,556.

^b Range in operators' labor incomes —\$2,088 to —\$8,913.

pellets. Some steers and heifers were fed to various stages of finish by these farmers and a few brought top-grade prices when sold.

Beef Cattle Sales and Receipts

Steers, heifers and calves accounted for about 78 per cent of the total receipts from cattle sales. The high income farmers placed greater emphasis on the sale of yearling steers and heifers than the low income group (Table 6). In other words, the high income operators carried more calves through the winter to be sold as yearlings the following year whereas many of the low income farmers operated their beef enterprises largely on a cow-calf basis.

The average weights of the different classes of cattle sold were: bulls 1,386 pounds, cows 1,086 pounds, steers 852 pounds, heifers 753 pounds and calves 398 pounds. Corresponding net receipts were: bulls \$237, cows \$158, steers \$192, heifers \$135 and calves sold at \$96 per head on an average for all farms. The high income farmers sold their steers at a heavier weight (880 pounds) than the low income group (814 pounds) and received higher prices per hundred pounds of steer sold.

Some of the operators expressed the opinion that purchases of additional calves in the fall, to be carried through the winter and sold the following autumn, had financial advantages. However, only two of the farmers interviewed purchased fall feeder calves in quantity in the year of the study. The inherent risk of loss through price fluctuations, however, appears to have discouraged operators from generally adopting the practice of buying feeder cattle to be sold at a later date.

Machinery and Equipment

Every beef farm operator had a car or light truck and several had additional trucks with a load capacity of two tons or more. Most farmers had at least two tractors and those operators engaged in logging activities had crawler type tractors as well. Other power driven equipment such as mowers, rakes, balers and bale elevators were on almost every farm.

The average annual cost to beef farm operators for the use of \$12,368 worth of farm equipment was \$3,280 or \$40 an animal unit. Included in the annual cost were general operating expenses (fuel, oil, repairs, license and insurance), depreciation and interest on capital (Table 7).

Labor

The beef farms employed an average 1.51 man-equivalents of total labor (4). All but 11 per cent of this was supplied by the operator and his family. The high income operators hired 15 per cent of their total labor compared with 7 per cent for the low income group.

Total productive man work units were calculated to measure the efficiency of labor (5). These numbers of units per farm also indicated the size of operations in terms of productive work accomplished during the year (Table 8). For all farms, the average was 596 P.M.W.U.'s per farm. On an average, the high and low labor income farms were slightly dissimilar in size being 583 and 608 P.M.W.U.'s respectively. Work units per man equaled 380 for the high and 408 for the low income group.

TABLE 7—AVERAGE VALUE AND ANNUAL COST OF MACHINERY, 21 BEEF FARMS, CENTRAL BRITISH COLUMBIA, 1966

	Operator's Labor Income		All Farms
	High ^a	Low ^b	
		dollars	
Average value of machinery.....	11,995	12,706	12,368
Annual cost			
Operating.....	1,414	1,384	1,398
Depreciation.....	1,121	1,158	1,140
Interest on investment at 6 per cent.....	720	762	742
Annual cost per farm.....	3,255	3,304	3,280
Annual cost per animal unit.....	42	38	40

^a Range in operators' labor incomes \$1,520 to —\$1,556.

^b Range in operators' labor incomes —\$2,088 to —\$8,913.

TABLE 8—AVERAGE AMOUNT OF LABOUR PER FARM AND EFFICIENCY OF LABOUR, 21 BEEF FARMS, CENTRAL BRITISH COLUMBIA, 1966

	Operator's Labor Income		All Farms
	High ^a	Low ^b	
	number		
Productive man work units			
Cattle.....	278.4	302.9	291.2
Other livestock.....	12.9	15.6	14.3
Crops.....	291.7	289.5	290.5
Total man work units.....	583.0	608.0	596.0
Hired labor days.....	72.1	33.6	51.9
Unpaid labor days.....	143.9	168.3	156.7
Operator labor days.....	262.7	264.0	263.4
Total farm labor days.....	478.7	465.9	472.0
Total man equivalents.....	1.53	1.49	1.51
Work units per man equivalent.....	380.0	408.0	395.0

^a Range in operators' labor incomes \$1,520 to —\$1,556.

^b Range in operators' labor incomes —\$2,088 to —\$8,913.

TABLE 9—COMPARISON OF BEEF FARMS, CENTRAL BRITISH COLUMBIA, 1963 AND 1966

	Unit	1963 (39 farms)		1966 (21 farms)	
		Per farm	Per A.U.	Per farm	Per A.U.
Capital investment.....	dollars	56,658	797	76,545	930
Family farm income.....	dollars	2,348	33	3,407	41
Operator's labor income.....	dollars	—1,042	—15	—2,395	—29
Non-farm income.....	dollars	1,890	—	2,003	—
Animal units of livestock					
Cattle.....	number	68.0	—	78.9	—
Other.....	number	3.1	—	3.4	—
Improved acres.....	number	254.7	3.6	264.0	3.2
Unimproved acres.....	number	1,087.6	15.3	1,428.0	17.4
Crop land					
Grain.....	acres	18.0	.25	18.0	.22
Hay and silage.....	acres	192.7	2.71	198.0	2.41
Improved pasture.....	acres	37.4	.53	39.0	.48
Grass land.....	acres	131.7	1.85	350.0	4.27
Machinery inventory.....	dollars	8,839	124	12,368	150
Annual machinery operating cost.....	dollars	2,351	33	3,280	40
Labor man equivalents.....	number	1.36	—	1.51	—
Productive man work units.....	number	547	—	596	—
Hay equivalents used ^a	tons	198	2.8	214	2.6

^a Silage converted to hay equivalents in the ratio of 3 tons silage to 1 ton of hay.

COMPARISON OF BEEF FARMS IN 1963 AND 1966

A comparison of the data obtained in the current beef farm study with that of the study conducted for the year 1963 indicated little change in the production pattern of these farmers during the period. However, the data provided a basis for the following observations (Table 9).

(1) Full-time beef farms increased in average size from about 71 to 82 animal units and from 255 to 264 improved acres during the interval between 1963 and 1966. Acreages of unimproved land increased by 340 acres, from 1,088 to 1,428 acres. Most of the

increase in unimproved acreage consisted of grass and meadow land which was relatively productive from a "grazing" standpoint.

Meanwhile, total capital increased by almost \$20,000 from \$56,658 (\$797 an A.U.) in 1963 to \$76,545 (\$930 an A.U.) in 1966, per farm. There was no apparent shift in resource allocation. The proportion of total capital in each of the main physical assets remained at 60 per cent in real estate, 23 per cent in livestock, 16 per cent in machinery and 1 per cent in other inventories.

(2) Although there has been some expansion in the size of full-time beef farms in the area, the net return to the operator has decreased. Comparative

operators' labor incomes, which were negative in both study years, amounted to -\$1,042 (-\$15 an A.U.) in 1963 and -\$2,395 (-\$29 an A.U.) in 1966 per operation. Specifically this amounted to an average decrease in earnings of \$1,353 (-\$14 an A.U.) per farm. Non-farm income on an average increased slightly from \$1,890 in 1963 to \$2,003 in the year currently under review.

(3) The decrease in operator's labor income could be attributed almost entirely to a combination of higher costs for the use of capital (5 per cent in 1963 to 6 per cent in 1966) and to a large increase in the amount of capital employed. This statement is supported by the fact that the family farm income per animal unit increased from \$33 in 1963 to \$41 in 1966. It is apparent however that the spread between current receipts and current expenses was not sufficient to offset the large increase in capital cost to the operator during the period.

(4) The pattern of land use showed little change. Acreage used for cereal grain crops remained at 18 acres per farm. Hay land acreage differed only by 5 acres, from 193 acres in the former survey to 198 acres per farm in the current study. Yields of hay and grain per acre were similar for both of the years studied.

(5) It was not possible to determine accurately the sale weights of all classes of cattle sold in the two years under review, but fairly reliable results were obtained for steers. This class of animal accounted for more than half of the total receipts from cattle and the comparative derived weights for steers sold in the 2 years were nearly the same at 852 pounds per animal.

(6) The indicated feeding period for the years under review was about 200 days. This required 2.6 to 2.8 tons of hay per animal unit for the winter feeding periods.

(7) Feeder calves were obtainable from Edmonton, Alberta; Williams Lake and Kamloops in British Columbia. The traditional markets for feeder steers from the area were Edmonton, Alberta and the Lower Mainland of British Columbia.

Methods of transporting purchased feeder calves were by rail from Edmonton, and by truck from Williams Lake and Kamloops. Cattle were shipped out of the area by rail for the most part, but several operators in the Burns Lake area shared the cost of transporting truck-load lots to markets in the Lower Mainland.

(8) Machinery and equipment values per farm increased by \$3,529 or from \$8,839 to \$12,368 during the period. Total annual operating costs increased in proportion to the values, from \$2,351 in 1963 to \$3,280 in 1966. Annual costs included oper-

ating costs (fuel, oil, repairs, licenses, insurance) together with depreciation and interest on the investment in machinery and equipment.

(9) Man equivalents of labor employed per farm were 1.36 and 1.51 for 1963 and 1966, respectively. Total productive man work units per farm increased from 547 to 596 during the period. There was little change in the efficiency of labor use as indicated by the number of productive man work units per man (402 in 1963 and 395 in 1966).

SUMMARY AND OBSERVATIONS

The averages obtained from the grouped data for the year 1966 on high and low income beef farms showed a distinct relationship existing between the operators' management practices and the size of incomes. More specifically, the factors influencing or determining the size of incomes were closely associated with management of beef cattle rather than crops or the cropping programs.

Capital investments were \$854 and \$993 per animal unit, respectively, for the high and low income farms. The smaller total investment resulted mainly from a lesser amount of capital being allocated to land and buildings by the high income group. As a consequence, this group had a substantially smaller capital cost in the form of interest on investment.

The high income operators averaged 26 cows per bull and obtained an 88.9 per cent calf crop. The low income group, by comparison, averaged 33 cows per bull and obtained a calf crop of only 77.3 per cent.

The high income operators practised a program of culling and replacement of breeding stock designed to maintain the numbers of cows and to improve their performance with respect to quality of calves produced. In contrast with this, the low income group sold large numbers of cows and heifers in addition to steers and calves, without replacements through purchases. This practice may, in part, have been a concerted effort to reduce the number of inferior stock in the breeding herd during the year of study. It is likely, however, that the low income farmers were forced to oversell in order to maintain financial solvency.

The high income group sold almost all of their young stock as yearling or "long yearling" steers and heifers. Many of the low income operators, by contrast, operated largely on a cow-calf basis and the steers that were sold by this group were, on an average, lighter in weight than those sold by the high income farmers.

A comparison of the data obtained from beef farm operators for the year 1963 and 1966 showed

little change in the organization and productive pattern of these farms. On an average, the farms surveyed increased in size from 71 to 82 animal units and from 255 to 264 improved acres during the period. Total capital investment per farm increased by about \$20,000 from \$56,658 in 1963 to \$76,545 in 1966. The larger capital investment and higher interest charge (interest was charged on capital at the rate of 5 per cent in 1963 and 6 per cent in 1966) resulted in an additional expense of \$1,760 per farm, or \$16 per animal unit, for the use of capital. The returns to the operator and family for farm labor and capital increased by only \$8 per animal unit. Consequently, the operator and family members received substantially less income for their labor in the latter period of operation.

Factors contributing to high operating costs in this region include:

- (1) Distance to service centres — about half of the operators lived from 30 to 50 miles from the nearest service centre.
- (2) Relatively high prices of fuel, oil, grease, and machinery repairs.
- (3) Logging and land clearing — several operators had heavy equipment for these purposes.

- (4) Type of enterprise — beef-hay-grain farms predominate and these require special equipment for each enterprise.

NOTES AND REFERENCES

- (1) The Economics Branch of the Canada Department of Agriculture, in co-operation with the British Columbia Department of Agriculture, is currently studying the economics of beef production of feeder cattle on ranches and feedlot finishing in the province. An appraisal of the consumption pattern of beef in British Columbia, the export and import of cattle, will be included in the study.
- (2) Sorboe, M. M., *et al.*, *Beef Farms in Central British Columbia, 1963* Canada Department of Agriculture (unpublished report).
- (3) Animal unit — is one mature cow, bull or horse or the rated equivalent in other livestock and poultry.
- (4) Man-equivalent — is the labor of one man, or equivalent, on the farm for one year i.e. 312 days of 10 hours.
- (5) Productive-man-work unit — is the average amount of directly productive work accomplished by one man in 10 hours. The number of work units is calculated by multiplying the acres of each crop and the numbers of each kind of livestock by units which have been established on the basis of the average amount of time required to handle one acre or one animal.

DEATHS OF FARM ANIMALS IN CANADA

W. Y. Yang

INTRODUCTION

Deaths of farm animals significantly affect farm production and income and therefore have critical implications for farm operators in the adoption and management of their livestock enterprises.

This preliminary study examines the extent and trends of farm animal deaths in Canada. Semi-annual data on the deaths of swine, cattle (separately for calves under one-year old and other cattle over one-year old), and sheep and lambs since 1951 were provided by the Dominion Bureau of Statistics (1). There are no figures available on the death losses of horses. It represents an exploratory approach to the study of losses from deaths (excluding slaughter for consumption) of farm animals by analyzing the available data for Canada as a whole. This study can provide guides for methods and procedures which might be used for computer processing of the data for individual provinces.

The D.B.S. series give the numbers of animal deaths during the two separate six-month periods of December through May, and June through November. In order to calculate the rate of deaths, the number of animals on farms on December 1 and June 1 are taken as the inventory basis. Inventory figures up to 1965 were obtained from the *Handbook of Agricultural Statistics, Part VI, Livestock and Animal Products, 1871-1965*; and for 1966 and 1967 these data were compiled from the semi-annual reports, *Livestock Survey: Cattle, Horses and Sheep* and *Livestock Survey: Hogs*, June 1 and December 1, both published by the Dominion Bureau of Statistics.

In addition to the calculation of the semi-annual and annual death rate per 1,000 animals, statistical measures such as arithmetic mean, standard deviation, coefficient of variability, standard error of estimate, coefficient of correlation, and regression coefficient have also been calculated in order to more fully understand the problems of animal deaths in Canada and to examine the reliabilities of the various calculated parameters. Since the problems dealt with here concern the rate of deaths, it is considered more appropriate to use the geometric mean and logarithmic measures. However the amount of work involved in data processing for Canada and for the provinces would be considerably increased, if geometric instead of arithmetic analysis is to be used.

Several methods are available for the calculation of annual death rates. The rates used here are the sums of the two semi-annual rates. Other methods are to divide the total animal deaths during a year

(sum of deaths in the two semi-annual periods) by the number of animals at the beginning of the year, or the end of the year, or the average of the number of animals at the beginning and the end of the year. As the number of animals at the beginning or end of a year is usually at the lowest level, the death rates thus calculated would be too high to be meaningful.

The most acceptable procedure would be to calculate an average inventory throughout the year on the basis of monthly or quarterly figures. However, these data are not available. Calculations were made by dividing the total number of animal deaths during the two six-month periods by the average number of animals on December 1 and June 1. The results were little different from the sums of two semi-annual death rates as derived from the procedure previously outlined and used in this study.

The annual death rates as presented here have the defect of adding together two ratios of different bases but they have the advantage of being consistent with the simple reasoning that two semi-annual parts should make an annual total. This advantage is obvious when both annual and semi-annual data are presented.

DEATH RATES

Death losses of sheep and lambs show the highest death rate, 107 per 1,000 in spring, 34 per 1,000 in fall and 141 per 1,000 for the whole year, of the three kinds of farm animals. Swine rank next, and cattle show the lowest death rate (Table 1).

Within the cattle group, calves less than one year old have much greater death rates than cattle more than one year old, particularly in the spring season. For the year as a whole, the average annual death rate of the calves amounts to more than 32 per 1,000 as compared with less than 14 per 1,000 for older cattle.

With the exception of swine, all other kinds of farm animals show very much higher death rates during the period of December through May than during the period of June through November. This is undoubtedly due to the higher death rate of infant and younger animals soon after birth.

The semi-annual death rate of swine does not show much difference between the two six-month periods, because a common practice is to have sows farrow twice a year. Consequently the chances of death of pigs are about even in both seasons.

From Table 2, it can be seen that the difference in the death rates of cattle (young and old), and sheep and lambs, between the two six-month periods are

TABLE 1—DEATH RATES (PER 1,000) OF FARM ANIMALS IN CANADA FROM DECEMBER 1950 TO NOVEMBER 1967

Kind of Animal	Semi-annual Death Rate				Annual Death Rate	
	December to May		June to November		17-year average	Standard error of estimates
	17-year average	Standard error of estimates	17-year average	Standard error of estimates		
Swine.....	37.065	±1.073	37.371	±1.301	74.436	±2.124
Cattle over 1 year.....	7.595	±0.104	6.033	±0.080	13.629	±0.121
Calves under 1 year.....	21.304	±0.242	10.765	±0.133	32.069	±0.261
All cattle.....	28.899	±0.293	16.798	±0.174	45.697	±0.345
Sheep and lambs.....	106.857	±2.411	34.163	±0.556	141.020	±2.562

TABLE 2—DIFFERENCES IN THE SEMI-ANNUAL DEATH RATES OF ANIMALS IN CANADA, BETWEEN DECEMBER THROUGH MAY AND JUNE THROUGH NOVEMBER, STANDARD ERRORS OF DIFFERENCE AND NUMBER OF STANDARD ERRORS IN THE DIFFERENCES, 1951 TO 1967

Kind of Animal	Difference between 2 semi-annual death rates	Standard errors of difference	Number of standard errors in the difference
Swine.....	0.306	±1.6363	0.187
Cattle over 1 year.....	1.562	±0.1276	12.241
Cattle under 1 year.....	10.540	±0.8468	12.447
All cattle.....	12.102	±0.3311	36.551
Sheep and lambs.....	77.694	±2.4000	32.373

statistically very significant, as they are all greater than 12-fold their respective standard errors. (A difference as much as three times its standard errors is considered to be very significant.) Such seasonal characteristics of the death rates of farm animals would certainly have serious implications in the planning and operation of government policies and programs of agricultural finance, credit, insurance, and animal health and protection.

VARIABILITY OF DEATH RATES

Fluctuations of death rates from year to year in the 17 years covered have not been very great for all animals (Table 3). On the basis of standard deviations (2) sheep and lambs show the greatest variation in the death rate except for the June to November season in which swine show the widest fluctuations. On the basis of coefficient of variability (3), swine always show the highest variation in relation to the average death rate. The death rate of cattle shows the smallest variation in their semi-annual and annual death rates, regardless of whether standard deviation or coefficient of variability is used as the criterion for comparison.

Thus in 2 out of 3 years, the annual death rate of cattle would occur in the range of 45.697 ± 1.380 , i.e. from 44.317 per 1,000 to 47.077 per 1,000; whereas for swine, the range would be $74.436 \pm$

8.497 or from 65.939 per 1,000 to 82.933 per 1,000; and for sheep and lambs, the annual death rate would occur in the range of 141.020 ± 10.249 , or from 130.771 per 1,000 to 151.269 per 1,000.

TREND OF DEATH RATES

Two measures are used to determine if there has been a trend in the death rate of farm animals in Canada. A simple correlation coefficient is employed to determine the degree and direction of the relationship between death rates and chronological years, and a regression coefficient is used to measure the amount of change from one year to the next in the death rate per 1,000.

Considerable relationship exists between death rates and chronological years for both swine, and sheep and lambs (Table 4). The relationship for cattle is rather erratic but some relationship does apparently exist, particularly for calves.

Swine are the only kind of farm animals in Canada which show a significant decreasing trend in death rate, while the death rates of calves, and sheep and lambs, are increasing particularly during the six month period of December through May (see figure). It is possible that these trends were caused by an improvement in the statistical enumeration which resulted in gradually more complete reporting of

ANNUAL DEATH-RATES (Number per thousand) OF FARM ANIMALS IN CANADA, 1951 to 1967

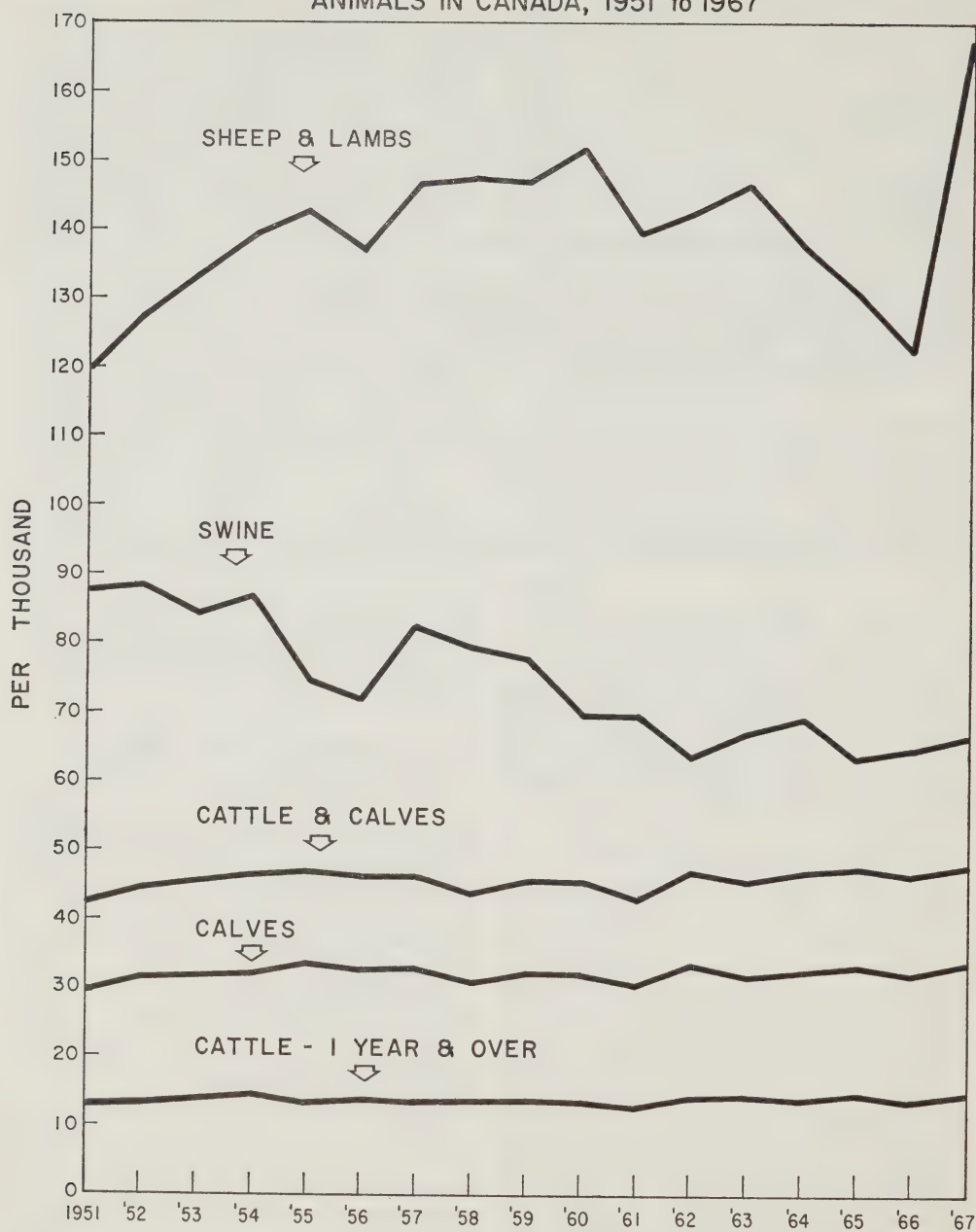


TABLE 3—STANDARD DEVIATION, AND COEFFICIENT OF VARIABILITY OF DEATH RATES OF FARM ANIMALS IN CANADA, 1951 TO 1967

Kind of Animal	Standard Deviation of death rate			Coefficient of Variability		
	December to May	June to November	12 months	December to May	June to November	12 months
	per cent					
Swine.....	4.293	5.204	8.497	11.58	13.92	11.41
Cattle over 1 year.....	0.417	0.320	0.484	5.49	5.31	3.55
Calves under 1 year.....	0.967	0.533	1.044	4.54	4.95	3.26
All cattle.....	1.173	0.698	1.380	4.06	4.16	3.02
Sheep and lambs.....	9.643	2.226	10.249	9.02	6.52	7.27

TABLE 4—RELATIONSHIP BETWEEN DEATH RATES OF FARM ANIMALS IN CANADA AND THE SEQUENCE OF YEARS IN TERMS OF CORRELATION COEFFICIENT, 1951 TO 1967

Kind of Animal	Correlation Coefficient					
	December to May		June to November		December to November	
Swine.....	-0.7812 ^a	±0.0945	-0.8041 ^a	±0.0857	-0.8872 ^b	±0.0516
Cattle over 1 year.....	-0.0340	±0.2423	+0.4660 ^b	±0.1899	+0.2790	±0.2237
Calves under 1 year.....	+0.6963 ^a	±0.1249	-0.2985	±0.2209	+0.4922 ^b	±0.1838
All cattle.....	+0.5617 ^a	±0.1660	-0.0141	±0.2425	+0.4703 ^b	±0.1889
Sheep and lambs.....	+0.6331 ^a	±0.1453	-0.3504	±0.2128	+0.5196 ^a	±0.1771

^a Significant at less than 1 per cent level.

^b Significant at about 5 per cent level.

^c Significant at about 1 per cent level.

TABLE 5—YEARLY INCREASE OR DECREASE IN THE TREND OF DEATH RATES OF FARM ANIMALS IN CANADA, IN TERMS OF REGRESSION COEFFICIENTS, 1951 TO 1967

Kind of Animal	Yearly Increase (+) or Decrease (-) of Death Rates					
	Semi-annual rate				Annual rate	
	December to May		June to November		December to November	
	Regression coefficient	Standard error of estimate	Regression coefficient	Standard error of estimate	Regression coefficient	Standard error of estimate
Swine.....	-0.6846 ^a	±0.1712	-0.8542 ^a	±0.1357	-1.5388 ^a	±0.0645
Cattle over 1 year.....	-0.0029	±2.8470	+0.0305	±3.2813	+0.0276	±2.3589
Calves under 1 year.....	+0.1374	±0.8822	-0.0325	±2.1264	+0.1049	±0.9907
All cattle.....	+0.1345	±0.8381	-0.0020	±1.7020	+0.1325	±0.7599
Sheep and lambs.....	+1.2462 ^a	±0.0954	-0.1592	±0.5001	+1.0870 ^a	±0.0991

^a Significant at the 1 per cent level.

deaths of young cattle. However, the problem deserves further investigation.

Table 5 gives the amount of increase or decrease in the semi-annual and annual death rates of the various kinds of farm animals in Canada. The remarkable downward trends in the death rates of swine and the upward trend in the death rate of sheep and lambs are again confirmed. With high standard errors and low regression coefficients the long term trend in the death rates of cattle is not significant. Nevertheless, the increasing tendency in the death rate of calves during the December to May period merits more research attention.

NOTES AND REFERENCES

- (1) Gratitude is extended to Mr. G. B. C. Murray and Mr. P. L. Beerstecher, Livestock and Animal Products Section, Agriculture Division, D.B.S., for their co-operation in providing the primary data and helpful assistance.
- (2) Standard deviation is a measure of variability of individual items above or below their average.
- (3) Coefficient of variability is a measure of the relative variability in which the standard deviation is expressed in per cent of the average.
- (4) Significant at less than 1 per cent level.
- (5) Significant at about 1 per cent level.
- (6) Significant at about 5 per cent level.
- (7) Significant at 1 per cent level.
The probability for these coefficients of correlation to occur due merely to chance is less than 1 to 5 in 100.

SOME OBSERVATIONS ON THE LONG TERM PROSPECTS OF THE CANADIAN PEACH INDUSTRY

J. R. Burns

The peach was established on the North American continent in Mexico some 400 years ago. It was not until 1793, however, that Canadian peach culture was first recorded. Those growing at Niagara-on-the-Lake during the tenure of Governor John Graves Simcoe were described as small but highly flavored.

Peach production in Canada is limited by the severity of climate and the suitability of the soil. The Niagara and the southwestern areas of Ontario, and the Okanagan Valley of British Columbia are the centres of Canadian production. The peach tree will tolerate winter temperatures to approximately -17°F but damage to flower buds occurs at -13°F . The two most favorable regions for peach growing in Ontario, the Niagara and Essex districts, have temperatures as low as -17°F about once every 30 years.

The peach is extremely sensitive to excesses of soil moisture and consequently production in Ontario is restricted to well-drained sandy loams such as the Harrow, Fox and Vineland series.

PRODUCTION

Production data since 1920 show a pattern of wide annual variations, giving credence to the statement that Canada is marginal for peach production. Commercially, peaches rank next in importance to apples. Annual production averages 106 million pounds with a value of more than \$7 million (Table 1). Largely because of climatic factors, production has been much below normal in three of the past five years.

TABLE 1—FARM PRODUCTION AND VALUE OF PEACHES IN CANADA, 1948 TO 1967

Year	Canada		Ontario		British Columbia	
	million pounds	thousand dollars	million pounds	thousand dollars	million pounds	thousand dollars
1948.....	88.0	4,953	51.5	2,716	36.5	2,237
1949.....	100.8	4,987	61.9	2,702	38.9	2,285
1950.....	61.1	2,822	57.0	2,494	4.2	328
1951.....	89.6	4,004	67.4	2,869	22.2	1,135
1952.....	145.9	5,152	118.7	4,384	27.2	768
Average						
1948-52.....	97.1	4,384	71.3	3,033	25.8	1,351
1953.....	144.7	5,543	117.5	4,565	27.2	978
1954.....	121.2	5,208	107.7	4,654	13.6	554
1955.....	144.1	6,125	118.5	5,235	25.6	890
1956.....	83.3	4,384	68.4	3,726	15.0	658
1957.....	140.0	6,218	113.3	5,289	26.8	929
Average						
1953-57.....	126.7	5,496	105.1	4,694	21.6	802
1958.....	152.1	5,761	129.4	4,886	22.8	875
1959.....	132.2	5,444	107.2	4,455	25.1	989
1960.....	118.1	6,137	88.6	4,994	29.4	1,143
1961.....	153.7	6,674	127.2	5,565	26.6	1,109
1962.....	112.8	5,784	81.6	4,570	31.2	1,214
Average						
1958-62.....	133.8	5,960	106.8	4,894	27.0	1,066
1963.....	118.6	6,933	97.0	5,844	21.6	1,089
1964.....	143.1	8,128	107.2	6,743	35.8	1,385
1965.....	80.3	5,531	80.3	5,531	—	—
1966.....	104.2	7,434	86.2	6,179	18.0	1,255
1967.....	82.3	n.a.	60.2	5,717	22.1	n.a.
Average						
1963-67.....	105.7		86.2		19.5	
Average						
1948-67.....	115.8		92.3		23.5	

n.a. = not available.

Sources: (1) *Estimate of the Commercial Production of all Fruits*, Catalogue Number 22-003, Seasonal, Dominion Bureau of Statistics.

(2) *Agricultural Statistics for Ontario*, Ontario Department of Agriculture and Food.

(3) Horticultural Branch, British Columbia Department of Agriculture.

Since 1948, Ontario has produced about 80 per cent of Canada's peaches. In Ontario, annual production for the past 5 years has averaged 86 million pounds valued at \$6 million, representing about 20 per cent of the value of all fruit production for the province. Excepting 1965, during which there was no commercial production because of severe weather conditions, the average crop in British Columbia is about 24 million pounds with a value of \$1.2 million. This represents about 4 per cent of the value of fruit production in that province.

In Ontario, the number of peach trees decreased by 20 per cent between 1951 and 1961, and a further 28 per cent between 1961 and 1966 (Table 2). In British Columbia, tree numbers increased by 21 per cent between 1951 and 1961, but by 1966 had decreased to less than the 1951 total.

The number of acres of peaches in Ontario decreased by 15 per cent between 1951 and 1961, and a further 19 per cent between 1961 and 1966. There was a 41 per cent decrease in the number of farms growing peaches during the 1961-66 period. The Ontario Tender Fruit Marketing Board reported that the number of growers selling peaches to processors decreased by 13 per cent from 1,239 growers in 1962 to 1,070 growers in 1966. Between 1961 and 1966, the average acreage of peaches per grower in Ontario increased from 4.4 to 6 acres.

Fewer data are available for British Columbia, but those that are available along with supplemental reports from the industry, indicate trends in acreages and numbers of farms growing peaches to be similar to those for Ontario.

In Ontario, yields per acre of peaches have been increasing, from 2.07 tons in 1951 to 3.89 tons per acre in 1966, an increase of 88 per cent. Thus, the decrease in number of trees was offset by the rising yield per acre and total production increased.

Tables 3 and 4 show the varieties grown in Ontario and British Columbia. The new varieties being planted are earlier maturing and more resistant to diseases, pests and winter injury. Processing varieties are also increasing in number planted.

MARKETING AND TRADE

More than half the total Canadian peach production is sold for fresh consumption and the remainder is packed by canners and processors (Table 5).

In British Columbia, aside from an estimated 3,000 to 5,000 tons sold on roadside stands, peaches are distributed to the fresh and processing markets through British Columbia Tree Fruits Ltd., the agency of the British Columbia Fruit Board. British Columbia peaches are sold mainly west of the Lakehead although in some years there have been sales as far east as Montreal.

The formation of the Ontario Fresh Peach Growers' Marketing Board in 1954 and its agency, the Ontario Peach Growers' Cooperative has greatly improved the marketing system for fresh peaches in Ontario. It has power to deal with problems concerning custom processing, the buying of whole crops and practices which had tended to reduce the effectiveness of price negotiations. Through the Board's actions have come higher minimum prices, a larger range of

TABLE 2—NUMBER OF PEACH FARMS, ACRES, TREES; AGE GROUP OF TREES AND YIELDS, CANADA, 1951 TO 1966

	1951	1956	1961	1966
Ontario				
Number of farms.....	n.a.	n.a.	3,105	1,815
Number of acres.....	16,265	16,455	13,810	11,069
Number of trees:				
total.....	1,913,031	1,732,913	1,531,079	1,096,869
under 5 years.....	741,729	n.a.	467,569	289,434*
5 years and over.....	1,171,302	n.a.	1,063,510	807,435*
Average yield per acre—tons.....	2.07	2.07	4.59	3.89
British Columbia				
Number of farms.....	n.a.	n.a.	2,608	n.a.
Number of acres.....	3,272	3,379*	3,468*	2,504*
Number of trees:				
total.....	287,020	337,989	346,884	250,400
under 5 years.....	121,980	n.a.	108,349	86,300
5 years and over.....	165,040	n.a.	238,535	164,100
Average yield per acre—tons.....	3.39	2.21	3.82	3.60

n.a. = not available

*3 years and under

*4 years and over

*Calculated 100 trees to the acre.

Sources: (1) *Census of Canada*, Dominion Bureau of Statistics

(2) *Agricultural Statistics for Ontario*, Ontario Department of Agriculture and Food.

TABLE 3—VARIETY AND NUMBER OF PEACH TREES IN ONTARIO, 1956, 1961 AND 1966

Variety	1956	1961	1966	1966 as a per cent of 1961
		number of trees		per cent
Earlired.....	—	—	27,210	—
Dixired.....	—	—	15,658	—
Red Cap.....	—	—	2,835	—
Royalvee.....	—	—	16,519	—
Garnet Beauty.....	—	—	13,875	—
Sunhaven.....	—	29,033	65,681	226.2
Erliglo.....	—	—	1,525	—
Jerseyland.....	17,810	22,696	12,146	53.5
Red Haven.....	92,020	136,629	133,009	97.3
Golden Jubilee.....	322,940	325,011	235,634	72.5
Envoy.....	22,450	33,738	45,444	134.7
Velvet.....	—	—	5,003	—
July Elberta.....	28,040	30,379	21,451	70.6
Valiant.....	54,890	38,131	18,033	47.3
Loring.....	—	29,177	53,362	182.9
Veteran.....	74,360	58,289	45,274	77.7
Kalhaven.....	—	—	5,764	—
McGuigan.....	12,800	22,942	25,486	111.1
Early Elberta.....	49,050	66,820	52,104	78.0
Redskin.....	—	16,189	23,407	144.6
Standard Elberta.....	313,600	239,010	136,261	57.0
Babygold 5.....	—	—	13,303	—
Babygold 6.....	—	—	9,361	—
Babygold 7.....	—	—	18,935	—
Babygold 8.....	—	—	8,687	—
Suncing.....	—	—	2,863	—
Other varieties.....	299,190	221,799	88,042	39.7
Total.....	1,287,150	1,269,843	1,096,869	86.4

Source: Ontario Tree Census, 1966, Ontario Department of Agriculture and Food.

TABLE 4—VARIETIES, NUMBER OF TREES AND ACREAGE OF PEACHES IN BRITISH COLUMBIA, 1966 AND 1967

Variety	Bearing Acres		Number of Trees	
	1966	1967	1966	1967
Jubilee.....	—	77.4	—	7,740
J. H. Hale.....	—	58	—	5,800
Elberta.....	—	298	—	29,800
Vees.....	—	755	—	75,500
Red Haven.....	—	437	—	43,700
Dixie Red.....	20	—	2,000	—
Sun Haven.....	31.5	—	3,150	—
Red Top.....	18.4	—	1,840	—
Triogem.....	41.9	—	4,190	—
Fair Haven.....	92.3	—	9,230	—
Solo.....	15.4	—	1,540	—
Red Globe.....	24.3	—	2,430	—
Hale Haven.....	7.7	—	770	—
Fortuna (Cling).....	94.8	—	9,480	—
Rochester.....	13.6	—	1,360	—
Spotlight.....	8.1	—	810	—

Source: British Columbia Tree Fruits Ltd.

expenses paid for by processors and grade standards for processing fruit. From 1954 to 1957, the Board sold an average of 37 per cent of the crop. During the 1963-67 period the yearly average was 40 per cent of the crop.

Ontario fresh peaches are sold from the Maritimes to Alberta. Between 1953 and 1957 a yearly average of 23 carlots of Ontario peaches was unloaded in the five main Prairie cities. In the next 5-year period (1958-62) this number increased to 70 carlots but

decreased in the 1963-67 period to an average of 54 carlots. In spite of a decrease in carlot unloads in 1966 and 1967, there has been an increasing trend in the marketing of Ontario peaches on the Prairies. This increase is most evident in Winnipeg, where the average number of rail and truck unloads doubled between 1953-57 and 1963-67.

Sales of peaches to processors in Ontario decreased from an average of 57 per cent of the crop during the period 1948-52 to 38.5 per cent in the 1963-67 period

(Table 6). The volume of sales of peaches to processors in British Columbia moved in the opposite direction and, excluding the crop failure of 1965, the average remains high. During the past 20 years the Canadian peach pack averaged more than 44 million pounds per year (Table 7). A peak of 66 million pounds was reached in 1955, after which production decreased. The average pack for the 5 years, from 1963 to 1967, was 32 million pounds but was only 15.7 million pounds for 1967. Ontario packs about 75 per cent of the Canadian total. In both British Columbia and Ontario the average peach pack has been decreasing.

Imports

Domestic production of peaches has been supplemented by imports of fresh peaches in an amount equal to an average of 17 per cent of production since 1948 (Table 5). From 1963 to 1967, fresh imports averaged 30 per cent of production ranging from 13 per cent in 1964 to 58 per cent in 1965. The quantity of imports has tripled over the past 20 years reaching 47 million pounds in 1960 and 46 million pounds in 1965. From 1963 to 1967 imports averaged nearly 32 million pounds per year. Almost all imports of fresh peaches are from the United States.

TABLE 5—DOMESTIC DISAPPEARANCE OF FRESH PEACHES, CANADA, 1948 TO 1967

Year	Production	Imports	Imports as a per cent of Production	Total Supply	Fresh Exports	Used for Processing	Domestic Disappearance as Fresh Fruit
	thousand pounds		per cent		thousand pounds		
Average 1948-52.....	97,063	10,378	10	107,441	680	48,921	57,859
Average 1953-57.....	126,690	23,482	18	150,171	1,530	59,526	89,315
Average 1958-62.....	133,810	34,813	25	168,622	520	60,464	107,637
1963.....	118,650	36,138	30	154,788	200	53,943	100,645
1964.....	143,100	18,504	13	161,604	200	60,423	100,981
1965.....	80,300	46,464	58	126,764	100	36,567	90,097
1966.....	104,250	34,000	33	138,250	400	38,800	99,050
1967.....	82,300	23,932	28	106,232	150	24,950	81,132
Average 1963-67.....	105,920	31,808	30	137,527	210	42,936	94,381

Sources: (1) *Trade of Canada*, Volumes II and III, Catalogue Numbers 65-202 and 65-203, Annual, Dominion Bureau of Statistics.

(2) *Crop and Seasonal Price Summaries*, Canada Department of Agriculture.

TABLE 6—SALES OF PEACHES TO PROCESSORS, ONTARIO AND BRITISH COLUMBIA, 1948 TO 1967

Year	Ontario				British Columbia			
	Quantity	Per Cent of Production	Value	Per Cent of Value	Quantity	Per Cent of Production	Value	Per Cent of Value
	thousand pounds	per cent	thousand dollars	per cent	thousand pounds	per cent	thousand dollars	per cent
Average 1948-52.....	40,430	56.7	n.a.	n.a.	8,280	32.1	n.a.	n.a.
Average 1953-57.....	51,140	48.7	2,554	53.1	8,080	37.4	546	66.1
Average 1958-62.....	49,680	46.5	2,287	46.7	11,010	40.8	543	50.9
1963.....	45,550	46.9	2,384	40.8	9,950	46.1	540	49.6
1964.....	46,100	43.0	2,537	37.6	15,600	43.5	795	57.4
1965.....	34,950	43.5	2,190	39.6	—	—	—	—
1966.....	30,850	35.8	1,925	31.2	6,749	37.4	459	36.5
1967.....	19,367	23.5	1,385	23.8	n.a.	n.a.	n.a.	n.a.
Average 1963-67.....	35,363	38.5	2,084	34.6	8,075*	31.7*	448*	35.8*

n.a. = not available

*4 year average, 1963-66

Sources: (1) *Crop and Seasonal Price Summaries*, Canada Department of Agriculture

(2) *Agricultural Statistics Report, 1966*, British Columbia Department of Agriculture.

Imports of canned peaches have increased during the last 20 years from an average of 9 million pounds in the 1948-52 period to more than 50 million pounds in the 1963-67 period (Table 8). In 1967, imports totaled 65.9 million pounds. In the 1948-52 period, Australia shared the Canadian import market almost equally with the United States. From 1953 to 1963 this market was dominated by the United States. Beginning in 1963, and more so in recent years, Australia began recouping its share. From 1958 to 1962, Australia's share was 1 per cent of the total canned imports and by 1967 had risen to 38 per cent. The United States' share averaged 68 per cent from 1963 to 1967 and was 55 per cent in 1967.

Exports

There has been a downward trend in the exports of both fresh and canned peaches (Tables 5 and 8). Almost all fresh exports go to the United States. Fresh peach exports were highest during the 1953-57 period with an average of 1.5 million pounds and decreased to a 1963-66 average of 250,000 pounds. The peak in canned exports occurred during the 1958-62 period. Most of these exports went to the United Kingdom and Europe. They averaged 1.5 million pounds in the peak period and then decreased to an average of 155,000 pounds in the 1963-67 period.

TABLE 7—PACK OF CANNED PEACHES, 1948 TO 1967

Year	Canada	Ontario	British Columbia
Average	thousand pounds		
1948-52.....	42,994	n.a.	n.a.
Average			
1953-57.....	52,116	47,375	8,918
Average			
1958-62.....	50,399	40,630	9,770
1963.....	42,721	34,683	8,038
1964.....	45,452	33,464	11,988
1965.....	28,482	24,081	4,401
1966.....	29,475	22,363	9,112
1967.....	15,708	11,323	4,385
Average			
1963-67.....	32,367	25,182	7,184

n.a. = not available

Sources: (1) *Canned and Frozen Processed Foods*, Catalogue Number 32-212, Dominion Bureau of Statistics.

(2) *Crop and Seasonal Price Summaries*, Canada Department of Agriculture.

TABLE 8—DOMESTIC DISAPPEARANCE OF CANNED PEACHES, CANADA, 1948 TO 1967

Year	Canned Peach Production	Imports of Canned Peaches	Imports as Percentage of Production	Total Supply	Exports	Available for Domestic Use
Average	thousand pounds		per cent	thousand pounds		
1948-52.....	42,994	9,068	21	52,062	90	51,972
Average						
1953-57.....	52,116	14,266	27	66,382	1,383	65,089
Average						
1958-62.....	50,399	26,346	52	76,745	1,576	75,169
1963.....	42,712	36,008		78,729	245	78,484
1964.....	45,452	40,359		85,811	174	85,637
1965.....	28,482	53,709		82,191	171	82,020
1966.....	29,475	58,716		88,191	40	88,151
1967.....	15,708	65,991		81,699	143	81,556
Average						
1963-67.....	32,367	50,957	157	83,324	155	83,169
Average						
1948-67.....	44,469	25,159	56	69,629	803	68,849

Sources: (1) *Canned and Frozen Processed Foods*, Catalogue Number 32-212, Dominion Bureau of Statistics.

(2) *Trade of Canada*, Volumes II and III, Catalogue Numbers 65-202 and 65-203, Annual, Dominion Bureau of Statistics.

Consumption

The Canadian annual per capita consumption of fresh and processed peaches rose 27 per cent over the past 20 years to an average of 8.9 pounds during the 1963-66 period (Table 9). There was a significant shift in consumption from fresh to processed peaches. Fresh peach consumption was highest in 1952 at 7 pounds and then dropped steadily to a 1963-66 average of 4.7 pounds per person. Consumption of processed peaches increased steadily from 2.8 pounds in 1948 to a high of 4.4 pounds in 1965, averaging 4.2 pounds in the 1963-66 period.

COSTS AND RETURNS

Surveys by the Ontario Department of Agriculture and Food show that the average cost of producing an acre of peaches increased by 58 per cent between

1954-56 and 1965-66 (2). Gross returns per acre increased by 50 per cent during the same period. Returns to risk and management dropped 6 per cent. On a per ton basis, returns remained the same whereas on a per farm basis they increased 15 per cent. Land and building charges increased 129 per cent per acre according to these studies. The value of peach land doubled between 1955 and 1965, rising from \$1,000 to \$2,000 per acre. (Some peach acreage sold recently for subdivision brought from \$3,000 to \$6,000 per acre.) While labor costs increased only 30 per cent per acre, machinery costs rose 164 per cent. The cost of materials increased by 36 per cent during the 10 years and miscellaneous costs decreased by 33 per cent per acre. Gross returns per acre for Ontario growers increased from an average of \$188 per acre during the 1948-52 period to an average of \$547 in the 5-year period 1963-67 (Table 10). In the Niagara

TABLE 9—PER CAPITA CONSUMPTION OF FRESH AND PROCESSED PEACHES, CANADA, 1948 TO 1966

Year	Fresh	Processed	Total	Population June 1
Average		pounds		thousands
1948-52.....	3.6	3.38	6.98	13,690
Average				
1953-57.....	5.15	3.96	9.11	15,704
1958.....	5.6	4.3	9.6	17,080
1959.....	5.0	4.2	9.2	17,483
1960.....	4.8	4.2	9.0	17,870
1961.....	5.3	4.1	9.4	18,238
1962.....	3.9	4.0	7.9	18,570
Average				
1958-62.....	4.92	4.16	9.08	17,848
1963.....	4.9	4.3	9.2	18,896
1964.....	5.0	4.2	9.2	19,237
1965.....	4.2	4.4	8.6	19,571
1966.....	4.8	3.9	8.7	20,015
Average				
1963-66.....	4.7	4.2	8.9	19,625

Source: *Apparent Per Capita Domestic Disappearance of Food in Canada*, Catalogue Number 32-226, Annual, Dominion Bureau of Statistics.

TABLE 10—PRICES AND RETURNS FOR PEACHES, ONTARIO, 1948 TO 1967

Year	Fresh and Processing	Processing	Gross Return per Acre
Average	cents per pound		dollars
1948-52.....	4.34	4.65	188
Average			
1953-57.....	4.54	4.72	299
Average			
1958-62.....	4.99	4.84	361
1963.....	6.19	5.20	
1964.....	6.69	5.50	
1965.....	7.25	6.30	
1966.....	7.72	6.20	
1967.....	10.00	7.02	
Average			
1963-67.....	7.57	6.04	547

Source: *Agricultural Statistics for Ontario*, Ontario Department of Agriculture and Food.

area gross returns per acre were larger and the upward trend steeper. Returns rose from \$351 per acre in the 1958-62 period to a \$591 average during the 1963-67 period, an increase of 68 per cent.

Prices

The average annual price for processing peaches between 1948 and 1952 was 4.65 cents per pound in Ontario (Table 10). Beginning in 1961 and continuing through 1967 the price per pound for processing peaches was less than that for fresh peaches.

In British Columbia prices for processing peaches have been higher generally than in Ontario and prices of peaches for the processing market have been higher than for the fresh market. The average price for processing peaches between 1955 and 1957 was 5.5 cents per pound while for the fresh market and the processing market combined it was 3.67 cents per pound. During the last few years the gap between these prices narrowed considerably with prices for fresh peaches rising faster than those for processing.

Wholesale to retail prices for Ontario fresh peaches rose from an average of 13 cents per pound in the 1948-52 period to 18 cents during the 1963-67 period. In 1966 the average price was 21 cents and for 1967 it was 26.4 cents. Prices for British Columbia fresh peaches averaged \$2.45 a box or about 13 cents a pound during the 1948-52 period and rose to \$3.09 for cell-pack or approximately 18 cents a pound in 1967.

WORLD PRODUCTION TRENDS

The main peach producing countries are Italy, France, Greece, Spain, Mexico, Japan and the United States in the northern hemisphere and Australia, South Africa and New Zealand in the southern

hemisphere. During the past 10 years, world production was dominated by the United States but there was considerable expansion elsewhere (Table 11). European production rose from a yearly average of 1,028 million pounds during the 1948-52 period to 4,300 million pounds during the 1963-67 period. Japanese production rose from 80 to 490 million pounds during the same period. On the other hand, United States production only increased from 3,042 million pounds to 3,523 million pounds. Australian production rose from an average of 119 million pounds in the 1948-52 period to a 240 million average in the 1963-66 period. New Zealand production almost doubled from 20 to 38 million pounds and South African production rose from 43 to 155 million pounds. Italy, the largest European producer traditionally grew for the fresh market but is developing a processing industry. French production was expected to be double the 1956-60 average by 1970 but passed that mark in 1965. Peach tree population for the fresh market in South Africa is declining but canning varieties are increasing. In the United States, a trend for peach tree numbers to decrease has been halted.

OUTLOOK

Up to this point we have surveyed the trends and summarized some of the main features concerning the peach growing industry in Canada. Now we propose to look briefly at likely developments in the future.

Acreage

The number of acres devoted to peaches in Canada has been decreasing during the past 10 years and this trend is likely to continue unless other

TABLE 11—FRESH PEACH PRODUCTION, MAIN PRODUCING COUNTRIES, 1948 TO 1967

Year	Canada	Mexico	United States	France	Italy	Greece	Spain	South Africa*	Japan	Australia	New Zealand
Average					million pounds						
1948-52.....	93.1	106.7	3,041.8	244.2	615.7	26.0	142.4	42.6	79.6	119.1	19.9
Average											
1953-57.....	121.1	118.1	2,983.2	406.0	992.4	44.7	214.1	112.9	189.2	131.5	18.7
Average											
1958-62.....	127.9	128.9	3,581.9	630.2	1,861.3	135.4	210.3	137.1	376.5	151.5	27.0
1963.....	113.9	160.8	3,544.8	1,005.3	2,793.2	125.7	286.6	112.0	437.8	209.6	—
1964.....	137.4	163.2	3,573.5	914.9	2,885.2	207.2	337.7	138.9	456.3	221.5	42.0
1965.....	77.1	158.7	3,497.5	1,014.1	2,865.6	205.8	373.2	183.7	504.9	254.2	54.1
1966.....	103.7	165.4	3,405.0	641.5	3,031.3	209.8	306.0	186.0	562.2	275.7	56.8
1967 ^b	85.9		2,700.0								
Average											
1963-66.....	108.0	162.0	2,344.1	894.0	2,893.0	187.1	325.9	155.2	490.3	240.2	38.2

*Unofficial

^bPreliminary

Source: *Agricultural Statistics*, United States Department of Agriculture.

factors change considerably. In Ontario, if recent trends continue, acreage could be as low as 5,000 acres in 1990, compared with the 1966 level of 11,000 acres. If, through the use of better varieties and rootstocks, peach production becomes more profitable and less subject to fluctuations in annual production, the downward trend could be slowed or even halted. In British Columbia, an estimate of bearing acreage showed an increase of 3 per cent for 1968 over that of 1966. Between 1968 and 1971 a further increase of 19 per cent, from 1,844 bearing acres to 2,195, is forecast. Nevertheless, this is still less than the 3,075 acres that were in production prior to the severe weather of 1965.

An average orchard size of 13.5 acres is predicted for Ontario in 1990. In British Columbia, orchard size will increase to much larger than the present average of two acres as management improves, and as production becomes concentrated in the hands of fewer producers.

Yield

By 1980 yields per acre in Ontario are expected to range between 4.6 tons and 5.3 tons. By 1990 they are expected to be between 5.4 tons and 6.4 tons an acre. In British Columbia, average yields are expected to rise to 6.7 tons an acre by 1971 and are likely to continue to increase.

Varieties

Some of the instability and weakness which characterizes the industry is due to varietal deficiencies. The quality of hardy seedling rootstocks has deteriorated in recent years. Insufficient winter hardiness of orchard trees has resulted, with root injury accounting for an estimated 25 to 50 per cent of tree losses. Scion varieties presently grown in Ontario include a considerable number of cold-tender types. This is a consequence of grower desire to upgrade fruit quality without equal regard for the structural and hardiness qualities of the trees.

A major plant breeding and evaluation program was initiated at the Harrow Research Station in southwestern Ontario in 1960, by the Canada Department of Agriculture. The main objectives of this program were to increase winter hardiness and resistance to canker disease. The results to date include 2 hardy, size-controlling rootstocks (Siberian and Harrow Blood) and a series of 15 new advanced selections of peaches and nectarines. These are currently undergoing thorough testing throughout the northern peach area of Canada and the United States. Of important long-range potential value is the search by Harrow scientists for sources of additional hardiness. Breeding material now includes advance

generation lines which have winter hardiness equivalent to that of Antonovka apple, about -37°F . Additional breeding is required, but with the aid of sophisticated selection methods now at hand, the rate of progress should be relatively rapid. Releases of new varieties to the grower-oriented Western Ontario Fruit Testing Association will bridge the gap between test plot and commercial orchard and speed up the transition considerably. Similarly the Summerland Research Station (British Columbia) has active programs working closely with the British Columbia Fruit Growers' Association.

Disease and Insect Pests

Peach canker is the major disease problem. Solution of the winter injury problem will undoubtedly reduce the incidence of this disease. Tolerance to it can also be incorporated into future varieties by selection procedures. Satisfactory methods for controlling the major debilitating insect pest, the peach tree borer, have been developed.

Mechanization

At the Summerland, Harrow and Vineland Research Stations, many phases of peach culture are under test that may eventually become standard orchard management practice. Mechanical pruning, thinning and harvesting of processing varieties are already used in some orchards and will be in common use soon.

Land Value

One of the most difficult factors to project with reliability is the future price of peach land. Over the past 15 years, there have been rapid increases in land prices in the Niagara Peninsula, Okanagan Valley and Southwestern Ontario. Industrial and urban expansion in the "Golden Horseshoe" of Ontario will no doubt continue, possibly even at a greater rate, thus land prices will be the biggest factor leading to a reduction in the peach acreage. Increases in yields and other cost reducing developments seem unlikely to outweigh this factor in the future, especially in the Niagara area.

The acreage of peaches grown in Southwestern Ontario might be extended to suitable soils along the north shore of Lake Erie. Competition from other agricultural crops that can be grown profitably in this area is a major factor on these favored soil types. As well, there is an increased risk in these areas of lower winter temperatures.

Prices

Prices for fresh peaches have been rising in recent years and probably will continue to do so. Peach prices must however continue at a high level in order to meet the rising costs of the inputs required for production. In Ontario, returns in recent years have been higher from the fresh market, whereas in British Columbia returns have been higher from the processing market, although the gap between the two prices now appears closed.

CONCLUSIONS

In spite of good prospects for results from research programs, other factors, particularly the increasing price of land resulting from the demand for urban and industrial uses, especially in the Niagara Peninsula seem likely to prevent any increase and may well bring about a decrease in peach acreage.

The volume of peaches going to the fresh market has held up in the face of short supplies during the past three years, indicating that processing sales are

residual. This pattern is likely to continue, especially if competition from processed imports continues to increase.

Canadian peach growers face increasing competition not only from the United States with its economies of scale, but from the less expensive land and labor countries of the Southern Hemisphere. European production will soon exceed demand and as this takes place, more of the crops from Australia and South Africa will likely seek an alternative market to those in Europe. It seems unlikely that in the long run, Canada can continue to competitively produce peaches for processing, but should be able to satisfy the bulk of the domestic fresh market for many years to come.

REFERENCES

- (1) *1966 Fruit Tree Census, Part II, Tender Fruits*, Ontario Department of Agriculture and Food, Toronto.
- (2) Regan, W. K. and Waller, H. A., *A Preliminary Report on the Cost of Production of Peaches in the Niagara Peninsula, 1965-1966*, Ontario Department of Agriculture and Food, Toronto.

PEAR PRODUCTION IN CANADA

Raziuddin M. Siddiqui

The purpose of this study was to determine the long-term outlook for pears for fresh consumption and for processing in Canada. The analysis consisted of a study of the trends during the years from 1946 to 1965.

Pears are grown in all provinces, but Ontario, British Columbia and Nova Scotia, are the main producers. The farm value of pears averaged \$3.4 million annually for 1961-65, and was \$4.2 million in 1966. The farm value for the national crop is about half that of peaches and represents a little over 5 per cent of the farm value of all fruit.

There are thousands of varieties of pears of which 125 or more have been grown in Canada at one time or another. However, only a few are now commercially important. The most important varieties in the commercial category are Bartlett and Kieffer. Other varieties grown in Canada are Gifford, Clapp, Boussock, Flemish, Howell, Louise, Duchess, Bosc, Clairgeau and Anjou. The Bartlett and Kieffer varieties are common in Ontario, Bartlett and Anjou in British Columbia, and Bartlett and Clapp in Nova Scotia.

Pear trees begin to bear fruit when 5 to 7 years old and usually reach full production between 12 and 15 years of age. Trees may live to be 100 years old, but in the average commercial orchard they are removed and replaced when between 30 and 40 years of age. At about this age, the vigor of the tree begins to decline, production falls off and the quality of the fruit is reduced (1).

PRODUCTION

According to the 1961 Census, there were 1.2 million pear trees in Canada on farms reporting 25 or more trees, a decline of about 4 per cent from 1951 (Table 1). The decline appears to have been more rapid during the second half of the decade. Tree numbers increased in all provinces except Ontario where the decrease was sufficient to offset the increase in the other provinces. However, annual surveys of fruit tree planting in Ontario suggest that since 1962, total pear tree numbers in the Niagara Fruit Belt have remained constant, with an increase in the proportion of young trees.

More than 10,000 farms reported 25 or more pear trees in 1961, of these 5,542 were in Ontario, 3,479 in British Columbia, and 820 in Nova Scotia (2).

The area planted to pear trees in Ontario averaged 5,863 acres during 1941-45, compared with 5,238 acres in 1961-65. Production, however, has shown a marked increase from 271,000 bushels to 916,000 bushels for the same period (3). The trend of higher yields per acre or per tree is evident in the other main producing provinces, British Columbia and Nova Scotia. According to the 1966 *Fruit Tree Census of Ontario*, Bartlett and Kieffer varieties represented 83 per cent of the total number of pear trees in Ontario, compared with 88 per cent in 1961. There was an increase of 2.1 per cent in the Bartlett variety but the Kieffer variety declined by 27 per cent. Bartletts are used mainly as fresh fruit, while Kieffers are used

TABLE 1—PEARS: NUMBER OF TREES, CANADA, 1941, 1951 AND 1961

		Less than 10 years	More than 10 years	Total
Ontario.....	1941	397,021	225,019	700,423
	1951	364,785	463,295	828,080
	1961	184,432	545,346	729,778
British Columbia.....	1941	122,491	85,950	227,387
	1951	193,698	144,144	337,842
	1961	164,297	235,033	399,330
Nova Scotia.....	1941	21,280	13,246	39,096
	1951	28,601	29,041	57,642
	1961	7,591	37,265	44,856
Canada.....	1941	547,434	324,660	978,526
	1951	590,877	637,786	1,228,663
	1961	361,838	820,181	1,182,019

Source: *Census of Canada, Agriculture*, Dominion Bureau of Statistics. The age breakdown of trees on farms with less than 50 fruit trees was not obtained in 1941, although the total includes trees on such farms.
Data are for farms recording 25 or more fruit trees.

mainly for processing. The average yield of these two varieties in 1961 was 2.5 and 4 tons per acre. The Kieffer variety, which was planted quite extensively in Ontario, is generally considered of poor quality. It is now a problem to market and is not being planted. The Bosc variety is gaining in popularity and the number of trees of this variety has increased substantially.

Although there have been annual fluctuations, total pear production in Canada has been increasing. During the period from 1946 to 1950 production averaged 925,000 bushels a year (Table 2). Production during the five years from 1961 to 1965 averaged 1.6 million bushels a year; in 1966 there was a record crop of 2.1 million bushels. It is only in Nova Scotia that there has not been an increasing trend in production.

PRICES

As well as fluctuating considerably from year to year, prices for pears vary between provinces. The national average farm price was \$2.20 a bushel during the years 1946 to 1950, declined to an average of \$1.80 for 1951 to 1955, rose to \$1.98 for 1956 to 1960 and to \$2.19 per bushel for 1961 to 1965. In 1966, the national average farm price was \$2.06 a bushel (Table 3).

For the major producing areas, farm prices are usually highest in British Columbia and lowest in Nova Scotia. During 1946-50, farm prices in Nova Scotia averaged \$1.69 a bushel, in Ontario, \$1.76, and in British Columbia, \$2.51. During 1961-65, prices in Nova Scotia averaged \$1.88 a bushel, in Ontario, \$2.03, and in British Columbia, \$2.67.

TABLE 2—PEARS: SUPPLIES AND DISTRIBUTION, CANADA, 1946 TO 1967

Year	Production	Imports	Total Supply	Exports	Processed	Available for Domestic Use	Per Capita Consumption
			thousand bushels				pounds
1946.....	951	383	1,334	6	306	1,022	4.0
1947.....	966	398	1,364	2	436	926	3.5
1948.....	789	3	792	3	287	502	2.0
1949.....	1,058	147	1,205	4	582	619	2.5
1950.....	864	359	1,223	3	520	700	2.5
Average 1946-50.....	925	258	1,184	4	426	754	2.9
1951.....	1,225	172	1,397	80	512	805	3.0
1952.....	1,303	405	1,708	42	320	1,346	4.5
1953.....	1,435	357	1,792	71	512	1,209	4.0
1954.....	1,261	459	1,720	57	617	1,046	3.5
1955.....	1,510	420	1,930	74	797	1,059	3.5
Average 1951-1955.....	1,346	362	1,709	65	552	1,094	3.7
1956.....	1,400	523	1,923	20	742	1,161	3.5
1957.....	1,094	561	1,655	20	541	1,094	3.5
1958.....	1,521	466	1,987	14	613	1,360	4.0
1959.....	1,276	674	1,950	10	779	1,161	3.5
1960.....	1,574	547	2,121	37	927	1,157	3.0
Average 1956-60.....	1,373	554	1,927	20	720	1,186	3.5
1961.....	1,477	511	1,988	54	745	1,189	3.0
1962.....	1,720	552	2,272	36	938	1,298	3.5
1963.....	1,688	341	2,029	190	755	1,084	3.0
1964.....	1,999	490	2,489	199	1,044	1,246	3.0
1965.....	1,065	660	1,725	35	694	996	2.5
Average 1961-65.....	1,589	510	2,101	103	835	1,162	3.0
1966.....	2,062	674	2,736	122	994	1,620	4.0
1967.....	1,747	409	2,156	175	685	1,296	3.0

- Sources: (1) *Value of Fruit Production*, Cat. No. 22-003, Dominion Bureau of Statistics.
 (2) *Estimates of Fruit Production*, Cat. No. 22-003, Dominion Bureau of Statistics.
 (3) *Trade of Canada, Imports by Commodities*, Cat. No. 65-203, Dominion Bureau of Statistics.
 (4) *Trade of Canada, Exports by Commodities*, Cat. No. 65-202, Dominion Bureau of Statistics.
 (5) *Crop and Seasonal Price Summaries*, Markets Information Section, Canada Department of Agriculture.

TABLE 3—PEARS: PRODUCTION AND AVERAGE FARM PRICE BY PROVINCES, 1946 TO 1967

Year	CANADA		ONTARIO		BRITISH COLUMBIA		NOVA SCOTIA	
	Pro- duction	Average Farm Price	Pro- duction	Average Farm Price	Pro- duction	Average Farm Price	Pro- duction	Average Farm Price
	thousand bushels	dollars/ bushel	thousand bushels	dollars/ bushel	thousand bushels	dollars/ bushel	thousand bushels	dollars/ bushel
1946.....	951	2.40	269	1.74	652	2.71	30	1.50
1947.....	966	2.25	393	1.62	543	2.76	30	1.42
1948.....	789	2.26	219	1.76	548	2.49	22	1.55
1949.....	1,058	1.94	504	1.69	539	2.18	15	2.00
1950.....	864	2.17	483	2.01	357	2.41	24	2.00
Average 1946-50.....	925	2.20	374	1.76	528	2.51	24	1.69
1951.....	1,225	1.83	563	1.69	624	1.94	38	2.00
1952.....	1,303	1.82	738	1.68	509	2.02	56	1.75
1953.....	1,435	1.85	754	1.73	649	1.98	32	2.00
1954.....	1,261	1.78	664	1.77	557	1.79	40	1.90
1955.....	1,510	1.71	887	1.57	581	1.90	42	1.95
Average 1951-55.....	1,346	1.80	721	1.69	584	1.93	42	1.92
1956.....	1,400	2.04	819	1.86	536	2.32	45	1.85
1957.....	1,094	2.01	380	1.92	691	2.07	23	1.80
1958.....	1,521	1.96	865	1.66	624	2.40	32	1.75
1959.....	1,276	1.78	767	1.54	474	2.17	35	1.80
1960.....	1,574	2.12	897	1.95	649	2.38	28	1.75
Average 1956-60.....	1,373	1.98	746	1.79	595	2.27	33	1.79
1961.....	1,477	2.10	816	1.83	610	2.47	51	1.92
1962.....	1,720	2.02	1,069	1.78	603	2.47	48	1.58
1963.....	1,688	2.37	731	2.19	893	2.56	64	1.64
1964.....	1,999	1.97	1,102	2.04	855	1.89	42	2.00
1965.....	1,065	2.50	887	2.29	130	3.98	48	2.25
Average 1961-65.....	1,589	2.19	921	2.03	618	2.67	51	1.88
1966.....	2,062	2.06	1,113	2.14	867	2.00	82	1.45
1967.....	1,747	—	894	—	790	—	63	—

Sources: (1) *Value of Fruit Production*, Cat. No. 22-003, Dominion Bureau of Statistics.(2) *Crop and Seasonal Price Summaries*, Markets Information Section, Canada Department of Agriculture.

Prices in Ontario and Nova Scotia are usually lower than the national average and in British Columbia are generally higher.

IMPORTS

Canada imports substantial quantities of both fresh and canned pears. Fresh pear imports are largely from the United States. New Zealand has also been a regular supplier of fresh pears to Canada. South Africa has supplied increasing quantities of pears in recent years. Argentina, Australia and Chile are also regular suppliers of small quantities of pears to Canada (Table 4). Although imports during 1961-65, at an annual average of 510,000 bushels, were almost double the 258,000 bushels average during 1946-50, there is no significant increasing trend. In 1966, imports of fresh pears totaled 674,000 bushels.

Canned pear imports for many years largely came from the United States, but since 1964 Australia has

become the main source of canned pears coming into Canada; the United States now takes the second place. During 1961-65 imports averaged 6.9 million pounds a year compared with the 1946-50 average of 939,000 pounds. In 1966, imports of canned pears totaled more than 11 million pounds, but decreased to 7.5 million in 1967. However, an upward trend in the imports of canned pears is evident (Table 5).

EXPORTS

Exports of fresh pears are not very large and the quantity fluctuates greatly without showing any trend. The United States is the biggest market for fresh pears. Other important markets are Britain, Sweden, Venezuela and Norway; and small quantities are exported to many other countries (Table 6). Exports averaged 3,600 bushels a year in 1946-50, increased to 65,000 bushels in 1956-60, and averaged 103,000 bushels a year in 1961-65. In 1964 exports of fresh pears reached a record 199,000 bushels.

TABLE 4—PEARS: IMPORTS BY COUNTRIES, CANADA, 1961 TO 1967

	1961	1962	1963	1964	1965	1966	1967
pounds							
Fresh Imports							
Argentina.....	396,193	720,481	599,085	882,511	235,685	79,896	281,511
Australia.....	—	—	—	295,600	—	18,624	—
Britain.....	29,120	—	—	—	—	105,156	—
Chile.....	41,957	143,444	82,636	37,312	95,964	162,724	50,690
Hong Kong.....	700	—	—	—	—	—	—
Netherlands.....	—	136,922	—	—	—	65,026	—
New Zealand.....	87,976	437,433	496,517	777,818	499,560	634,580	616,820
United States.....	24,287,498	25,901,111	13,351,806	22,371,490	27,886,689	33,019,294	15,546,759
South Africa.....	—	20,000	520,000	636,350	1,098,500	1,957,235	2,030,700
Total.....	24,843,444	27,359,391	15,050,044	25,001,081	29,816,398	36,042,535	18,526,480
Canned Imports							
Australia.....	756,561	1,194,726	3,163,155	6,868,113	8,481,560	9,843,680	6,961,080
United States.....	4,504,974	4,418,104	3,913,346	2,994,530	2,902,515	3,053,256	3,038,741
South Africa.....	—	—	—	203,239	—	—	157,680
Total.....	5,261,535	5,612,830	7,076,501	10,014,882	11,384,075	12,896,936	10,157,501

Source: *Trade of Canada, Imports by Commodities*, Cat. No. 65-203, Dominion Bureau of Statistics.

TABLE 5—CANNED PEARS—SUPPLIES AND DISTRIBUTION, CANADA, 1946 TO 1967*

Year	Beginning Stocks	Production	Imports	Total Supply	Exports	Ending Stocks	Domestic Disappearance	
							Total	Per Capita
				thousand pounds			pounds	
1946.....	3,018	13,946	63	17,027	1,179	1,318	14,530	1.2
1947.....	1,318	23,804	1,100	26,222	480	7,507	18,235	1.4
1948.....	7,507	13,209	603	21,319	187	3,114	18,018	1.4
1949.....	3,114	24,637	1,205	28,956	34	7,601	21,321	1.6
1950.....	7,601	29,076	1,724	38,401	513	14,689	23,199	1.7
Average 1946-50.....	4,512	20,934	939	26,385	478	6,845	19,061	1.46
1951.....	14,689	22,247	2,035	38,971	42	25,356	13,573	1.0
1952.....	25,356	13,332	1,210	39,898	52	9,434	30,412	2.1
1953.....	9,434	23,065	1,325	33,824	60	6,992	26,772	1.8
1954.....	6,992	31,147	2,459	40,598	964	12,850	26,784	1.7
1955.....	12,850	36,380	2,844	52,074	845	19,013	32,216	2.0
Average 1951-55.....	13,864	25,234	1,974	41,073	392	14,729	25,951	1.72
1956.....	19,013	34,832	2,855	56,700	940	19,810	35,950	2.2
1957.....	19,810	25,787	4,367	49,964	984	14,772	34,208	2.1
1958.....	14,772	26,080	3,651	44,503	2,006	9,755	32,742	1.9
1959.....	9,755	32,125	5,980	47,860	1,034	13,698	33,128	1.9
1960.....	13,698	34,768	4,074	52,540	807	21,106	30,827	1.7
Average 1956-60.....	15,410	30,071	4,185	50,313	1,102	15,828	33,371	1.96
1961.....	21,106	30,804	4,484	56,394	2,996	15,085	38,313	2.1
1962.....	15,085	35,648	4,863	55,596	5,314	8,787	41,495	2.2
1963.....	8,787	28,655	5,581	43,023	1,027	7,951	34,045	1.8
1964.....	7,951	37,379	12,031	57,361	316	11,485	45,560	2.4
1965.....	11,485	27,277	7,670	46,432	232	10,878	35,322	1.8
Average 1961-65.....	12,883	31,952	6,925	51,761	1,977	10,837	38,947	2.06
1966.....	10,878	38,503	11,167	60,548	544	18,456	41,548	2.1
1967.....	18,456	25,713	7,530	51,699	2,120	10,646	38,933	1.9

* Crop years.

Sources: (1) *Stocks of Canned Foods*, Cat. No. 32-011, Dominion Bureau of Statistics.

(2) *Canned and Frozen Processed Foods*, Cat. No. 32-212, Dominion Bureau of Statistics.

(3) *Trade of Canada, Imports by Commodities*, Cat. No. 65-203, Dominion Bureau of Statistics.

(4) *Trade of Canada, Exports by Commodities*, Cat. No. 65-202, Dominion Bureau of Statistics.

TABLE 6—PEARS: EXPORTS BY COUNTRIES, CANADA, 1961 TO 1967

	1961	1962	1963	1964	1965	1966	1967
pounds							
Fresh Exports							
Brazil.....	—	—	—	—	—	45,000	450,000
Britain.....	374,800	380,905	858,510	585,224	7,525	36,000	672,294
Denmark.....	—	—	—	—	45,000	—	36,800
Finland.....	—	—	67,500	36,000	—	—	—
Ireland.....	—	—	36,000	15,000	—	36,000	—
Norway.....	—	36,000	—	477,450	232,310	67,500	613,810
Panama.....	—	—	—	—	—	—	29,250
Peru.....	—	18,000	13,500	13,950	15,000	40,000	—
Sweden.....	108,000	—	861,460	1,234,990	—	640,865	815,815
Trinidad and Tobago....	—	—	—	—	—	—	70,650
United States.....	2,127,274	1,008,466	7,574,073	7,146,838	1,485,481	3,773,145	6,913,644
Venezuela.....	65,250	42,000	81,140	541,996	—	95,914	72,000
West Germany.....	—	—	—	180,191	—	—	281,750
Others.....	4,500	9,750	14,063	45,469	200	41,875	48,015
Total.....	2,679,824	1,495,121	9,506,246	10,277,108	1,785,516	4,776,299	10,004,028
Canned Exports							
Britain.....	1,848,751	7,135,365	1,712,580	590,983	144,260	195,620	558,157
Guyana.....	35,878	29,489	25,045	24,957	47,187	46,449	34,140
Congo.....	—	17,616	—	—	—	—	—
Ireland.....	23,203	—	—	—	—	—	—
Jamaica.....	26,150	16,836	15,080	23,675	26,059	—	11,038
Netherlands.....	—	—	21,000	—	22,825	—	14,963
United States.....	1,125	—	—	162,333	—	—	1,014,289
West Germany.....	—	65,025	52,200	—	—	91,513	18,448
Others.....	39,947	39,823	16,074	29,174	6,374	10,004	11,918
Total.....	1,975,054	7,304,154	1,841,979	831,122	246,705	343,586	1,662,953

Source: *Trade of Canada, Exports by Commodities*, Cat. No. 65-202, Dominion Bureau of Statistics.

In contrast with fresh pears, exports of canned pears show an increasing trend since 1956. Britain and Guyana have been regular customers for canned pears. Usually only small quantities of canned pears go to the United States but in an occasional year the United States may take a large quantity. Exports of canned pears show great fluctuation from year to year, from about 34,000 pounds to almost 3 million pounds.

PROCESSING

Although the proportion of the domestic pear crop going for processing varies from year to year, it usually ranges between 40 and 50 per cent of the crop. During 1946-50 about 46 per cent of the crop was processed, in 1951-55, 41 per cent, in 1956-60, about 52 per cent, and during 1961-65 it was 52.5 per cent. In 1966, 48.2 per cent of the record crop of more than 2 million bushels was processed.

There has been a definite upward trend in the amount of pears canned. During 1946-50, an average

of 20.9 million pounds of canned pears was produced. In 1966, canned pear production totaled a record 39 million pounds, but declined in 1967 to 26 million pounds (Table 6).

In recent years only small quantities of imported pears have gone into processing. About 4 per cent of the imported pears went for processing during 1961-65 compared with 18 per cent in 1946-50 (Table 7). During 1961-65, the amount of imported pears that went into processing was equivalent to one per cent of domestic production in the same period.

CONSUMPTION

Total consumption of fresh pears increased from an average of 754,000 bushels a year in 1946-50 to an average of about 1.2 million bushels from 1956-1965. There has been little change in total consumption since 1956. In 1966, consumption totaled 1.6 million bushels. Although fluctuating from year to year, per capita consumption of fresh pears has been declining

TABLE 7—FRESH PEARS: IMPORTED PEARS USED FOR PROCESSING AND FOR FRESH CONSUMPTION, 1946 TO 1967

Year	Total Imports	For Processing	For Fresh Consumption
	thousand pounds		
1946.....	19,484	1,938	17,546
1947.....	21,358	4,977	16,381
1948.....	nil	nil	nil
1949.....	5,973	180	5,793
1950.....	17,894	4,999	12,895
Average			
1946-50.....	12,941	2,419	10,523
1951.....	8,936	1,765	7,171
1952.....	19,165	1,011	18,154
1953.....	17,393	2,903	14,490
1954.....	22,967	5,183	17,784
1955.....	19,758	1,231	18,527
Average			
1951-55.....	17,643	2,419	15,225
1956.....	23,546	1,844	21,702
1957.....	27,997	1,332	26,665
1958.....	23,117	184	22,933
1959.....	34,702	982	33,720
1960.....	26,802	280	26,522
Average			
1956-60.....	27,232	924	26,308
1961.....	24,843	400	24,443
1962.....	27,359	1,068	26,291
1963.....	15,050	107	14,943
1964.....	25,001	606	24,395
1965.....	29,816	2,915	26,901
Average			
1961-65.....	24,413	1,019	23,394
1966.....	36,043	3,070	32,978
1967.....	18,526	—	—

Sources: (1) *Trade of Canada, Imports by Commodities*, Cat. No. 65-203, Dominion Bureau of Statistics.

(2) *Fruit and Vegetable Canners and Preservers*, Cat. No. 32-218, Dominion Bureau of Statistics.

(3) *Total Acquirements of Fresh Fruit and Vegetables*, Dominion Bureau of Statistics.

since 1951, from an average of 3.7 pounds during 1951-56 to 3 pounds during 1961-65 (Table 2).

Total consumption of canned pears has been increasing, from an average of 19 million pounds in 1946-50 to 39 million pounds in 1961-65. In 1966, consumption of canned pears totaled 42 million pounds. Per capita consumption of canned pears has also been increasing, from 1.46 pounds in 1946-50 to 2.06 pounds in 1961-65 (Table 6).

SUMMARY AND CONCLUSION

On a five-year average basis, production of both fresh and processed pears has increased continuously since 1946-50. Although total consumption of fresh pears has increased, the trend in per capita consumption shows a decline. The total consumption of processed pears doubled between 1946-50 and 1961-65, but the increase in per capita consumption was very moderate. There is great variation in the quantities of fresh pears that move into international trade and no trend is apparent. Exports of canned pears have shown an upward trend since 1956. Despite increased production, the price has been rising since 1956. Although production of fresh and processed pears has risen substantially, it is still short of Canadian requirements, especially in the case of processed pears, the consumption of which has increased.

Pears are easy to produce compared with other fruit such as peaches because pears require less labor, have higher average yields and can be ripened in storage. They are also hardier and can withstand adverse weather better than peaches.

Prospects for growing more pears in Canada seem very promising since the requirements are far in excess of Canadian production at the present time.

NOTES AND REFERENCES

- (1) *Fruit and Vegetable Facts and Pointers*, United Fresh Fruit and Vegetable Association, Washington, D.C.
- (2) *Census of Canada, Agriculture* Vol. 5, Dominion Bureau of Statistics.
- (3) *Tender Fruit, 1966 Fruit Tree Census*, Ontario Department of Agriculture and Food.
- (4) *Trade of Canada, Imports by Commodities*, Cat. No. 65-203, Dominion Bureau of Statistics.
- (5) *Trade of Canada, Exports by Commodities*, Cat. No. 65-202, Dominion Bureau of Statistics.
- (6) *Value of Fruit Production*, Cat. No. 22-003, Dominion Bureau of Statistics.
- (7) *Estimates of Fruit Production*, Cat. No. 22-003, Dominion Bureau of Statistics.
- (8) *Crop and Seasonal Price Summaries*, Markets Information Section, Canada Department of Agriculture.
- (9) *Stocks of Canned Foods*, Cat. No. 32-011, Dominion Bureau of Statistics.
- (10) *Canned and Frozen Processed Foods*, Cat. No. 32-212, Dominion Bureau of Statistics.
- (11) *Fruit and Vegetable Canners and Preservers*, Cat. No. 32-218, Dominion Bureau of Statistics.
- (12) *Total Acquirements of Fresh Fruits and Vegetables*, Dominion Bureau of Statistics.

POLICY AND ADMINISTRATION OF PUBLIC LANDS IN MANITOBA WITH PARTICULAR REFERENCE TO AGRICULTURE ⁽¹⁾

T. F. Joyce

The Crown lands of Manitoba are considered as a natural resource to be controlled and managed for the economic, social and cultural welfare of the people. Current policies emphasize the utilization, management, conservation and improvement of natural resources for forestry, wildlife, fisheries recreation and agriculture. In response to changing concepts and knowledge of land use capabilities, pertinent statutes and regulations have been amended in recent years and further modifications may be expected. Because government ownership and management of present provincial land is deemed to be in the best interests of the public, only a limited acreage is alienated each year. Where privately owned land, generally of low productivity, is needed for programs of improved land use, it is acquired and added to the Crown lands of the province.

Manitoba is the sixth largest province of Canada and covers an area of 251,000 square miles. Of these, 211,775 square miles are land and 39,225 square miles are fresh water. Approximately 194,605 square miles or 77.5 per cent of the total area is provincial land including 6,324 square miles in provincial parks and forests (Table 1). In contrast, federal lands amount to only 3,077 square miles, 1.2 per cent of the total area. About 53,318 square miles, 21.3 per cent, are privately owned or in process of alienation from the Crown.

With regard to the total land area, 28,391 square miles, 13.4 per cent, is occupied agricultural land of which nearly two-thirds is improved acreage (Table 1). Another 120,492 square miles, 56.9 per cent, is forested land with almost half designated as productive. The remaining 62,892 square miles, is classed as "other". This consists of urban land, road allowances, grass and brush land and all waste land such as open muskeg, swamps, rock and unclassified land.

The acreage of provincial Crown land is relatively small in the southern and southwestern parts of the province where the main agricultural lands are located. To the east and to the north, however, there is a pioneer agricultural area in which a considerable acreage of provincial Crown land occurs. Outside this area lie the Pre-Cambrian (forested) region and the Sub-Arctic (forest tundra) region. In these regions a minor amount of land has been alienated from provincial ownership and none is in agricultural use.

TABLE 1—TOTAL LAND AND WATER AREA OF MANITOBA CLASSIFIED BY TENURE AND USE

	Square Miles	Per Cent
Total Land Area.....	211,775	84.4
Total Fresh Water Area.....	39,225	15.6
Total Area of Province.....	251,000	100.0
Tenure (circa) 1965		
Federal Lands		
National Parks.....	1,113	0.4
Indian Reserves.....	816	0.3
Other.....	1,148	0.5
Total.....	3,077	1.2
Provincial Lands		
Provincial Parks.....	909 ^a	0.3
Provincial Forests.....	5,415	2.2
Other.....	188,281	75.0
Total.....	194,605	77.5
Privately owned land or land in process of alienation from the Crown.....		
	53,318	21.3
Total Area of Province.....	251,000	100.0
Use in 1962:		
Occupied Agricultural Land		
Improved.....	18,694	8.8
Unimproved.....	9,697	4.6
Total.....	28,391	13.4
Forested		
Productive.....	55,860	26.4
Non-Productive.....	64,632	30.5
Total.....	120,492	56.9
Other.....	62,892	29.7
Total Land Area.....	211,775	100.0

^a There are also 1,945 square miles of provincial park land within provincial forests.

Source: *Canada Year Book 1967*, pages: 7, 34 and 441.

ADMINISTRATION

Most of the public lands of Manitoba are under the jurisdiction of the Lands Branch, the Forestry Branch and the Wildlife Branch, Renewable Resources Division, Department of Mines and Natural Resources. Other departments, branches and authorities are, however, involved. The Department of Tourism and Recreation through its Parks Branch has control over parks and other recreational lands. Lands reserved to the Department of Agriculture for community pastures are, by agreement, administered, managed and developed by the Prairie Farm Rehabilitation Administration of the Government of Canada.

The Crown Lands Act is the legal authority for the administration of public lands in Manitoba. It established the Lands Branch of the Department of Mines and Natural Resources which manages, administers and makes disposition of provincial Crown lands. This Act also provides for the setting aside of certain Crown lands for use as provincial parks, forest reserves, game reserves or bird sanctuaries or any similar purpose.

The Minister of the Department of Mines and Natural Resources has an appointed Land Utilization Board which assists in an advisory capacity. Members of the Board within his Department are the Director of Lands, the Director of Forestry, the Director of Surveys, and the Provincial Land Use Co-ordinator. The Director of Soils and Crops, Department of Agriculture, is also a member. The principal function of the Board is to make recommendations as to use and disposal of Crown lands. It is not concerned with private lands.

The Lands Branch has responsibility for lands of Local Government Districts (municipal units administered by provincial government administrators). Through a memorandum of understanding negotiated with the Department of Municipal Affairs in 1963-64, these lands are administered by the Lands Branch under uniform policies in common with other provincial Crown lands. Undisposed school lands are administered on a similar basis.

As custodian for some 92,000,000 acres of provincial Crown land, the Lands Branch is responsible for all aspects of land inventory. It keeps the official records and is involved in the various transactions dealing with the sale, rental, transfer and acquisition of public land. It issues one-year general permits for recreational, commercial and residential uses of Crown lands. It grants right-of-way agreements for utilities and allows easement agreements in perpetuity or for as long as they may be required. It also issues all permits and leases for recreational purposes on Crown lands other than designated park and recreational areas. These are administered by the Department of Tourism and Recreation. For field administration purposes, the province is divided into six districts each with an inspector who performs inspection and appraisal duties and makes recommendations concerning the disposition and utilization of Crown lands.

To determine the general capability and land use potential of Crown lands, soil specialists of the Lands Branch make exploratory and reconnaissance investigations in sparsely settled and unsettled portions of the province. They also participate in an integrated and continuing program of soil survey and soils

investigation in organized and pioneer portions of the province. Such activities are a part of the systematic survey of the soils of Manitoba known as the Manitoba Soil Survey. This is a co-operative project with the Research Branch, Canada Department of Agriculture; the Soils and Crops Branch, Manitoba Department of Agriculture; and the Department of Soil Science, University of Manitoba. Land survey work and mapping are functions of the Surveys Branch of the Department of Mines and Natural Resources.

The Planning Act, 1964, gives the Department of Municipal Affairs the authority to assist municipalities in determining the most desirable plans of land use including the designation of areas for various purposes. Most of these purposes are urban but farming, forestry, and mining are included. Some rural municipalities have applied for planning aid under the Planning Act but they have not used its power to control agricultural land.

For the implementation of various land utilization policies, the Lands Branch acquires parcels of privately owned acreage to consolidate blocks of land for use as provincial parks, recreational areas, provincial forests, wildlife sanctuaries and community pastures. In the year ending March 31, 1967, 4,710 acres of alienated lands were obtained for the above purposes. The mechanics of land acquisition are carried out under the Land Acquisition Act, 1965, which established the Land Acquisition Branch of the Department of Public Works. The Minister of that Department is responsible for the acquisition of land or the expropriation of land by any provincial authority. All such land becomes public land and thereafter is under the administration of the particular agency, branch or department of the government for which it was acquired.

Some lands restored to Crown registry under the Land Acquisition Act are for schemes carried out with A.R.D.A. to put low productivity agricultural areas into more appropriate forms of land use. By agreement A.R.D.A. pays half the cost of projects for alternate uses of land, soil and water conservation, and rural development areas. Two agreements with A.R.D.A., the Canada Land Inventory and the Interlake Inventory Program, are entirely supported by federal funds. Under the Fund for Rural Economic Development agreement, the federal and provincial governments will spend \$27,510,000 to improve the land and water resources in the Interlake Rural Development Area. All A.R.D.A. projects are undertaken and administered by the various resource branches of the Manitoba Government. There is, however, an ARDA-FRED Co-ordinator who is located within the Department of Agriculture.

LAND UTILIZATION AND DISPOSITION

Crown land utilization in Manitoba falls into four categories: (1) lands reserved for public service such as parks and recreational areas; (2) lands reserved for the conservation and development of specific natural resources such as provincial forests, wildlife reserves, water power reserves and community pastures; (3) undifferentiated and unsurveyed lands north of the pioneer agricultural area that are important for their wildlife, fish production and hydro power capabilities; and (4) land available for disposition by leasehold, permit or agreement for sale.

Agriculture

Parcels of Crown lands in the main agricultural area may be alienated if they can be properly integrated into established farm units. All sales are made at the appraised market value with leaseholders being given the first option to purchase. Otherwise the land is sold by tender. Land sales in the pioneer agricultural area are made only if the soil is suitable for cultivation and if public services are available. In this area there are three settlement projects in which Crown lands are for sale. What is more or less an experimental land settlement project is located in the Saskatchewan River delta area. Farm units there may be acquired by rental agreement with the operator having an option to purchase after five years. As mentioned, a very small amount of Crown land is being sold. In the fiscal year ending March 31, 1967, 5,354 acres were transferred to private ownership.

In 1967, 1,530,156 acres of public lands were under crop share leases, farm and ranch grazing leases, grazing leases, and grazing and hay permits. The crop share leases were held by 77 farmers covering 15,362 acres. They were usually granted for a three-year period with a stipulated annual rental of one quarter of the grain crop. The grassland leases and permits represented 5,293 farmers and ranchers utilizing 1,514,792 acres. A further 166 farmers had 44,534 acres under lease-option agreement in the Pasquia Land Settlement Project.

New hay and grazing regulations under Manitoba Regulation 99/63 were put into effect in the fall of 1963. The revised grassland policy made ranch grazing leases, farm grazing leases and grazing permits more attractive for both security of tenure and fairness of rental terms. The ranch grazing lease, a renewable 10 year lease, is designed to meet the need of operators requiring large grassland acreages for fodder or forage or both. The farm grazing lease, a renewable five year lease, is designed for operators

wanting supplementary fodder or forage. The casual grazing permit, valid for one year, is designed for operators requiring fodder or forage in times of emergency. Grazing land rental fees are based on the seasonal carrying capacity of the land, the average expected gain per head and the sale price of beef cattle at the St. Boniface stockyards for the six months previous to October 31st or other specified period of the previous year. Lands leased for grazing are classified and rated for carrying capacity but with a provision for reclassification in the case of dispute. Leases may not be reassigned without permission. A farmer or settler applying for a ranch grazing lease must be 21 years old and either a Canadian citizen or one who is ordinarily resident in Canada.

The Lands Branch maintains effective control over the utilization and improvement of ranch and farm grazing leases. It specifies that the grassland must be properly managed and conserved and that it be used only for grazing and native hay production. Although grassland may not be improved without permission, the Lands Branch promotes the development of approved acreage. It is the practice now to reassess the carrying capacity of such land for five years after improvement. In the meantime the operator benefits and recovers his development costs. The longer term renewable leases encourage lessees to undertake construction improvements such as fences, corrals, shelters and dugouts. Upon the expiration of a lease or its permitted assignment, the lessee may either sell or remove such improvements.

There are two types of hay permits: casual and special. Casual hay permits are issued only for annual use with the permittee having no renewal rights. Special hay permits are issued annually to farmers who regularly require additional fodder and these permits carry the right of first opportunity to renew subject to compliance with regulations.

Through the Department of Agriculture and in co-operation with A.R.D.A. there is a policy to encourage the development of pasture and hayland by bush removal in the Interlake and Westlake areas. The assistance is available for both land leased from the Crown and privately owned land up to the maximum rate of \$2 per acre for knocking down the bush and \$2 per acre for piling it.

When technical experts of the government determine that a particular area is suitable for use as a community pasture, the land therein is reserved to the Department of Agriculture for community pasture purposes. As such it then comes under the 1939 agreement with P.F.R.A. whereby the federal agency develops community pastures in the province. A close liaison, however, exists between the Depart-

ment of Agriculture and P.F.R.A. with regard to the operation and development of the pastures. In the summer of 1967 there were 369,257 fenced acres of public lands in 20 P.F.R.A. community pastures. They were patronized by 1,095 patrons and stocked with 20,768 cattle and 5,839 calves. A 9,800 acre pasture is under construction and two potential areas are under consideration.

The province promotes the formation of larger and more economic farm and ranch units through the allocation of its leased land. Farm grazing leases are expressly intended to establish enlarged farm enterprises. Ranch grazing leases comprise large and compact acreages that are available to partnerships, grazing associations and companies as well as to individual operators. When a parcel of Crown land is for sale, it may be awarded to that applicant whose farm will benefit the most by virtue of its increased size and productivity.

Farm enlargement and consolidation in Manitoba for the most part depends on the availability of credit much of which is obtained from the federal Farm Credit Corporation. Because it was felt that considerable farm enlargement and consolidation has taken place in recent years and that the present need is for an emphasis on intensive rather than extensive farming, the provincial government repealed the Agricultural Credit Act which extended long term credit for the purchase of land and replaced it with the Agricultural Credit and Development Act in 1968. This Act underwrites loans by banks and other approved lending institutions for the purpose of increasing farm income and production, i.e., the improvement of farm land and buildings and the purchase of livestock, agricultural implements and farm machinery.

Forestry and Wildlife

Manitoba has 9 provincial forests covering approximately 5,500 square miles. No disposition sale, settlement or occupancy is permitted in a provincial forest except under the authority of the Forest Act. To modernize policies and operations a new Forest Act and new Regulations under the Act were proclaimed in 1965. All matters relating to forestry are regulated and administered by the Forestry Branch of the Department of Mines and Natural Resources. It initiates and implements programs or measures for the improvement and management of forests, reforestation, forest inventory, timber harvesting and its disposition through timber-cutting rights. Under the recently introduced Quota System timber operators are given security of tenure and the consolidation of small holdings is encouraged. Provincial forests afford a considerable yield of hay

and grazing sites for cattle. In the 1966-67 fiscal year the Forestry Branch issued 45 permits for the cutting of 850 tons of hay and 51 permits for the grazing of 1,633 head of livestock.

Under the Wildlife Act, 1963, the Wildlife Branch of the Department of Mines and Resources is responsible for those Crown lands designated as wildlife management areas. Any lands deemed necessary for such purposes may be purchased, expropriated or otherwise acquired. The main concern of the Wildlife Branch is to manage the wildlife resource of the province so that it will provide ample recreational and commercial opportunities in both the present and the future. To that end it undertakes wildlife survey and management projects, research projects and habitat projects, promotes the fur trade and supervises registered trap lines on Crown lands that are otherwise undifferentiated.

The Field Operations Branch of the Department of Mines and Natural Resources carries out field work on behalf of Forestry and Wildlife, and implements renewable resource programs that result from research and policy decisions. For administrative purposes the province is divided into four regions each of which is under a Regional Director. The regions in turn are divided into Conservation Districts and each district has one or more Conservation Officers.

Parks and Other Recreational Lands

During the 1966-67 fiscal year the Parks Branch of the government was transferred from the Department of Mines and Natural Resources to the Department of Tourism and Recreation. Through the Parks Branch the Minister of Tourism and Recreation manages, operates and develops a park system that comprises nearly 3,000 square miles of public lands. Some parks are located within provincial forests but in such instances the designated park land is not withdrawn from the respective provincial forests. There are nine provincial parks and numerous recreational, wayside and heritage areas. Park sites are located in all parts of the province including the northern area and they are administered under a multiple use concept that provides for the co-ordinated management of all the renewable resources of the land. When required, agricultural land is purchased or expropriated for inclusion in park sites. Some grazing is permitted in parks in prairie areas.

Water Control and Conservation

The Water Control and Conservation Act, 1967, (vice the Land Drainage Arrangement Act, repealed)

provides for the establishment of the Water Control and Conservation Branch. This Branch has recently been transferred from the Department of Highways to the Department of Mines and Natural Resources. It is responsible for the administration of all Acts that relate to the utilization, conservation and development of the water resources of the province. In addition, the Branch carries out the design, construction, maintenance and operation of water control works and provides engineering and financial assistance to municipalities and other authorities under terms of the Water Control and Conservation Act.

ACKNOWLEDGMENTS

- (1) For the most part this article is based on annual reports of the Manitoba Department of Mines and Natural Resources and the booklet *Manitoba Crown Lands* by J. H. Ellis, published by the Lands Branch, Manitoba Department of Mines and Natural Resources. Some information was obtained from the annual reports of the Manitoba Department of Agriculture and the booklet *ARDA in Manitoba* by J. D. Giles, distributed under the authority of the Manitoba Minister of Agriculture, January, 1968.
- (2) The assistance of Manitoba Government officials in providing assistance as to the interpretation of regulations dealing with land policy and in reviewing this article is acknowledged and greatly appreciated.

POLICY AND PROGRAM DEVELOPMENTS

Egg Price Support Program—The Agricultural Stabilization Board announced a deficiency payment of 0.4 cents per dozen for eggs marketed in the 1967-68 support year. Total payments to producers will amount to approximately \$500,000.

To be eligible for the deficiency payment, producers must be registered with the Agricultural Stabilization Board and have sold eggs through approved egg grading stations or be registered producers who did their own grading and sold directly to retail outlets.

Payment applies to Grade A Extra Large, Grade A Large and Grade A Medium size eggs, to a maximum 10,000 dozen.

Producers shipping less than 1,000 dozen eggs in the support year are not eligible for the deficiency payment. (October 21, 1968)

Alberta Potato Growers' Marketing Order—The Alberta Potato Commission is authorized to regulate the marketing of potatoes in interprovincial and export trade and for such purposes may, with respect to persons and property in the Province of Alberta, exercise all or any powers like the powers already held for the marketing of potatoes within Alberta. (October 22, 1968)

Manitoba Potato Marketing Order—The Manitoba Vegetable Marketing Commission is authorized to regulate the marketing of potatoes in interprovincial and export trade and for such purposes may, with respect to persons and property situated within the Province of Manitoba, exercise all or any powers like those already held for the marketing of potatoes within Manitoba. (October 22, 1968)

Duty on United States Corn Imports—Effective October 31, 1969, the federal government will apply value for duty on United States corn imported into Canada. This is to ensure that corn does not move into Canada at prices below the U.S. support level of \$1.05 (U.S.) per bushel. (October 29, 1968)

Farm Credit Act Amendments—Effective November 15, 1968 until March 31, 1969, the interest rate on Farm Credit Corporation loans will be 7.75 per cent per annum and, on loans made under the Farm Machinery Syndicates Credit Act, the interest rate will be 7.5 per cent per annum.

The amendments make provision for adjusting the interest rates automatically on April 1 and October 1 of each year. The interest rate on Farm Credit Corporation loans is set at 1 per cent above the average yield, in the preceding 6 months, of Government of Canada bonds maturing in 1 to 5 years. For loans made under the Farm Machinery Syndicates Credit Act, the interest rate is set 1 per cent above the average yield of bonds maturing in 1 to 10 years.

The new rates will provide for the operating costs of the Farm Credit Corporation on future loans, including part of the cost of making farm appraisals. Therefore the Corporation is now able to reduce the appraisal fee to borrowers by 50 per cent.

The new appraisal fees are 20 cents for each \$100 of a loan under Part II of the Farm Credit Act and 25 cents for each \$100 of a loan under Part III of the Act. (November 15, 1968)

Farm Improvement Loans Act Amendments—A new feature of the Farm Improvement Loans Act is an amendment which provides for loans to purchase land as an addition to an existing farm. A maximum of \$15,000 can be borrowed for this purpose and there is a repayment period of up to 15 years.

The interest rate on this type of loan, effective November 15, 1968 until March 31, 1969, is 7.75 per cent per annum. For the same period, the interest rates on loans for the previously authorized purposes such as the purchase of implements, buildings and livestock and for general improvements is set at 7.5 per cent per annum.

Under this revised legislation farm improvement loan interest rates will be automatically adjusted on April 1 and October 1 of each year.

Interest rates on both types of loans will consist of a base rate plus an allowance of 1 per cent for administrative costs. The base rate in each semi-annual period for land purchase loans is the average yield, in the preceding 6 months, of Government of Canada bonds maturing in 1 to 5 years. For loans for other purposes the base rate is the average yield of bonds maturing in 1 to 10 years.

Another amendment to the Farm Improvement Loans Act extends the range of eligible lenders to include loan, trust and insurance companies, credit unions and caisses populaires. (November 15, 1968)

PUBLICATIONS

ECONOMICS BRANCH PUBLICATIONS

Provincial Agricultural Legislation in Western Canada, 1967 Supplement, Economics Branch, Canada Department of Agriculture, Ottawa, Pub. No. 68/12, August, 1968, pp. ii+109 to 135.

This publication is a supplement to the bulletin entitled *Provincial Agricultural Legislation in Western Canada 1966*. This supplement brings up-to-date the summaries of statutes in that bulletin by outlining the agricultural legislation that has since been passed by the legislatures of the four western provinces.

OTHER PUBLICATIONS

Not available from Economics Branch

Ontario Co-operatives, 1966-67, Ontario Department of Agriculture and Food, Toronto, 1968, pp. x+76.

This is the report of a survey of co-operative business organizations in Ontario, conducted jointly by the Farm Economics, Co-operatives and Statistics Branch, Ontario Department of Agriculture and Food and the Department of Agricultural Economics, Ontario Agricultural College, University of Guelph, with the collaboration of the Economics Branch, Canada Department of Agriculture. The publication contains information on the various kinds of co-operatives in Ontario, their volume of business, financial structure and internal organization.

The Impact of Edible Oil Products on the Dairy Industry, Barfoot L. W., A. D. MacDonald and W. R. Redelmeier, Farm Economics, Co-operatives and Statistics Branch, Ontario Department of Agriculture and Food, Toronto, June, 1968, pp. iv+71.

This is the third in a series of studies dealing with problems in the dairy industry. The present study examines the impact of edible oil products and related dairy substitutes on the dairy industry. It includes a detailed analysis of these new products as to their origin, salient characteristics, market penetration and economic importance. There is also information on dairy product substitutes in other countries.

White Bean Production, Production Costs, Returns and Management Practices in Southwestern Ontario. Tolton, B. H., Farm Economics, Co-operatives and Statistics Branch, Ontario Department of Agriculture and Food, Toronto, July, 1968, pp. v+26.

This publication contains data on the production costs, returns and management practices of white bean production, taken from surveys in Southwestern Ontario.

Air Photo Interpretation in the Development of Canada, Queen's Printer, Ottawa, 1968, pp. iv+214.

This publication contains the papers presented at the second seminar on photo-interpretation held at Ottawa, March 13 to 15, 1967. The papers illustrate the problems encountered in evaluating rural land resources and give some of the solutions.

An Analysis of Resources in Alberta's Lesser Slave Lake Area, Rural Development Research Branch, Economics Division, Alberta Department of Agriculture, Edmonton, Alberta, June, 1968, pp. xiii+148.

This is a report of a study carried out under the Agriculture and Rural Development Act. The report contains an inventory of the resources in the Lesser Slave Lake area and describes the existing socioeconomic conditions in that area.

Grape Production in the Niagara Peninsula, Dillon, W. J., Farm Economics, Co-operatives and Statistics Branch, Ontario Department of Agriculture and Food, Toronto, August, 1968, pp. 34.

This publication describes the production costs, returns and the management practices of grape production. It is based on a study done in the Niagara Peninsula from 1959 to 1962.

Marketing Fresh Strawberries in Ontario, Blum, H. and M. Al Hashimi, Farm Economics, Co-operatives and Statistics Branch, Ontario Department of Agriculture and Food, Toronto, 1968, pp. 35.

This is the report of a study of the marketing of fresh Ontario-grown strawberries during the 1967 season. It describes strawberry production in Ontario, the channels of distribution for fresh strawberries and various other aspects of marketing the crop. Included are recommendations for improvement of the marketing system.

STATISTICAL APPENDIX

AVERAGE PRICES OF SELECTED CANADIAN FARM COMMODITIES, VARIOUS MARKETS AND GRADES, 1967-68

Commodity, grade and market	1967			1968			
	Average	Sept.	Oct.	July	Aug.	Sept.	Oct.
dollars per cwt.							
CATTLE (weighted average prices at public stockyards)							
Good slaughter steers							
Toronto.....	27.65	28.60	28.74	27.32	28.20	28.84	27.51
Winnipeg.....	26.60	28.57	28.47	27.61	28.26	28.83	28.36
Calgary.....	26.05	27.78	27.85	26.70	27.21	27.04	26.17
Good feeder steers							
Toronto.....	28.70	29.50	28.53	30.06	29.99	28.25	27.67
Winnipeg.....	26.55	26.92	25.96	27.93	27.66	26.79	26.81
Calgary.....	26.40	27.12	27.14	27.05	27.11	27.12	26.35
Good and choice veal calves							
Toronto.....	36.15	32.30	33.66	34.56	32.70	33.00	33.40
Winnipeg.....	38.85	38.05	36.30	36.32	33.97	35.96	35.85
Edmonton.....	30.40	26.88	23.94	28.93	29.35	27.21	25.90
HOGS (weighted average prices at public stockyards, Grade A dressed)							
Toronto.....	30.70	30.08	29.23	32.30	34.22	34.28	33.05
Winnipeg.....	28.55	28.65	27.87	30.38	33.78	33.39	31.92
Calgary.....	27.05	26.77	26.17	27.63	30.55	31.21	30.22
LAMBS (weighted average prices at public stockyards, Good lambs)							
Toronto.....	26.65	26.59	25.27	34.53	27.43	24.77	26.80
Winnipeg.....	21.40	20.36	20.00	28.04	23.22	22.23	24.56
Calgary.....	20.40	18.71	19.53	24.78	22.04	20.61	20.22
FLUID MILK (f.o.b. factory)							
Halifax.....	6.24	6.45	6.45	6.45	6.70	6.70	6.70
Montreal.....	5.96	6.00	6.00	6.00	6.00	6.00	6.00
Toronto.....	5.98	6.10	6.10	6.15	6.15	6.65	6.65
Winnipeg.....	5.84	5.97	5.97	5.97	5.97	5.97	5.97
Vancouver.....	6.93	7.08	7.09	6.89	6.90	6.92	6.90
MANUFACTURING MILK (average farm value) ^{a,4}							
Nova Scotia.....	3.22	3.30	3.38	3.25	3.81	—	—
New Brunswick.....	3.12	3.11	3.13	3.02	3.01	—	—
Quebec ^b	3.32	3.34	3.39	3.35	3.35	—	—
Ontario ^c	3.28	3.33	3.42	3.26	3.27	—	—
British Columbia.....	3.27	3.31	3.31	3.15	3.19	—	—
cents per lb.							
BUTTERFAT (for butter, average farm value) ^{a,*}							
Prince Edward Island.....	67.7	68.0	68.0	67.0	67.0	—	—
Quebec ^b	64.8	64.5	64.5	65.5	65.5	—	—
Ontario ^c	61.3	61.6	61.7	61.6	61.8	—	—
Saskatchewan.....	62.5	62.2	62.4	61.8	62.3	—	—
British Columbia.....	—	—	—	—	—	—	—
cents per doz.							
EGGS (average paying prices at registered grading stations, Grade A Large)							
Halifax.....	36.3	39.5	40.2	34.6	40.7	48.4	42.8
St. Anselme.....	35.5	37.0	38.3	33.4	41.2	50.0	47.0
London.....	33.4	35.2	36.0	30.9	38.0	47.0	45.5
Winnipeg.....	26.9	30.0	27.9	26.4	31.5	38.7	36.6
Vancouver.....	30.2	31.0	28.4	38.5	44.0	43.3	46.2
cents per lb. live							
BROILERS (average prices paid to growers No. 1 grade chicken under 5 lbs.)							
Toronto.....	19.6	19.0	19.2	21.5	21.5	21.5	21.5
Edmonton.....	21.0	20.2	20.8	22.2	22.4	22.5	22.5
TURKEYS (average prices paid to growers, No. 1 grade, 12-20 lbs.)							
London.....	23.7	24.0	24.9	23.9	24.1	25.5	25.5
Edmonton.....	25.4	25.0	25.5	—	—	26.5	26.8

AVERAGE PRICES OF SELECTED CANADIAN FARM COMMODITIES, VARIOUS MARKETS AND GRADES, 1967-68
(Concluded)

Commodity, grade and market	1967-68	1967		1968			
	Crop Year Average	Sept.	Oct.	July	Aug.	Sept.	Oct.
POTATOES (Can. No. 1 Table, average prices to growers)							
		dollars per cwt.					
Prince Edward Island.....	1.51	1.20	1.37	2.43	2.43	1.37	1.12
New Brunswick.....	1.22	1.03	1.38	2.73	1.70	1.25	1.13
Southwestern Ontario.....	1.92	1.92	1.97	2.50	2.40	2.27	2.03
EASTERN GRAINS							
		cents & eights per bu.					
Oats (Ont. No. 2 White, f.o.b. shipping points)...	85	85	85	85	81/2	77/4	70
Barley (Ont. good malting, f.o.b. shipping points)...	141/2	145	145	137	128/4	120	118/2
Corn (Ont. No. 2 Yellow, f.o.b. Chatham, 15% moisture, in carlots).....	130/7	149/2	132/2	130	131/4	130/2	109
Soybeans (Ont. No. 2, f.o.b. Chatham).....	278	295/1	287/5	269/5	270/3	262/4	248/7
WESTERN GRAINS (basis in store Fort William/ Port Arthur, less freight and elevator handling charges)							
Red Spring Wheat (No. 2 Nor.)							
Winnipeg.....	179/5	178/5	180/2	180/5	181/7	183/2	179/6
Regina and Edmonton.....	176/2	175/1	176/6	177/1	178/3	179/6	176/2
Durum Wheat (No. 1 C.W.A.D.)							
Winnipeg.....	201/2	218/7	213/5	192/5	193/2	193/4	198
Regina and Edmonton.....	197/6	215/3	210/1	189/1	189/6	190	194/9
Feed Wheat							
Winnipeg.....	164/5	163/5	165/2	165/5	166/7	166/5	160/3
Regina and Edmonton.....	161/2	160/1	161/6	162/1	163/3	163/1	156/7
Oats (No. 1 feed)							
Winnipeg.....	82/4	83/1	82/3	81/7	76/5	76/7	76/1
Regina.....	80/4	81/1	80/3	79/7	74/5	74/7	74/1
Edmonton.....	78/4	79/1	78/3	77/7	72/5	72/7	72/1
Barley (No. 1 feed)							
Winnipeg.....	110/4	113/3	111/5	102/4	97/4	97/4	96/4
Regina.....	107/5	110/4	108/6	99/4	94/4	94/4	93/4
Edmonton.....	104/5	107/5	105/7	96/6	91/6	91/6	90/6
Rye (No. 2 C.W.)							
Winnipeg.....	120/3	118/1	118/5	111/6	108/1	112	112/4
Regina.....	116/1	114/6	115/2	108/3	104/6	108/5	109/1
Edmonton.....	113/6	111/4	112	105/1	101/4	105/3	105/7
Flaxseed (No. 1 C.W.)							
Winnipeg.....	336/6	336/4	323/7	347/4	337/4	332	323/1
Regina.....	334/3	333/2	320/5	354/2	334/2	328/6	319/7
Edmonton.....	330	329/6	317/1	340/6	330/6	325/2	316/3
Rape seed (No. 1 C.W. basis in store Vancouver)	226/7	237/6	231/4	201/6	207/4	215/2	208/3

*Since the average farm values for manufacturing milk and butterfat published by the Dominion Bureau of Statistics (D.B.S.) do not include the Federal subsidies, it is necessary to add, during the 12 months' period ended March 31, 1968, the Federal payment of \$1.21 per 100 pounds of milk testing 3.5% butterfat, of which 11 cents were retained for export aid. The net payment was made directly to producers at the equivalent rate of 31.42 cents per pound of butterfat. Similarly for 1968-69, \$1.31 (less 15 cents) per 100 pounds should be added to manufacturing milk and 37.42 cents per pound (less 1 cent) to butterfat. The 1967 yearly average figure excludes the Federal payment of 85 cents per 100 pounds (less 7.3 cents for export assistance) for the January-March period.

*The 1967 yearly average farm values for manufacturing milk and butterfat to producers in the Province of Quebec exclude a subsidy payment of 10 cents a pound butterfat, made by the Quebec Government, for the January-March period. The policy was terminated on March 31, 1967.

*The 1967 yearly average farm values to producers in the Province of Ontario exclude a payment, made by the Ontario Government, for the January-March period of 25 cents a 100 pounds of manufacturing milk and secondary and excess fluid milk delivered to plants, basis 3.5% butterfat. For all cream grading Special and No. 1 the payment was 10 cents a pound butterfat.

*Beginning January 1, 1968, a new D.B.S. series for the average farm value of manufacturing milk includes all milk used for manufacturing purposes. Milk used for the manufacture of butter was previously excluded. Comparable figures are shown for 1967.

*Beginning January 1, 1968, a new D.B.S. series shows the price of butterfat in cream for manufacturing into butter (farm-separated cream) and is not comparable with the previously published series for butterfat, which included the butterfat in milk used for manufacturing into butter. Comparable figures are shown for 1967.

Government
Publications

VOLUME 3

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FEBRUARY 1969

CANADIAN FARM ECONOMICS



Commodity Review.....	1
Agricultural Demand and Supply Projections for 1980 Zenon Yankowsky	11
The Anti-Dumping Act: Implications for Canadian Agriculture..... M. N. Gifford	18
The Economics of Ethyl Alcohol Production With Particular Reference to Potatoes As A Raw Material G. G. Pearson	20
Policy and Program Developments.....	25
Publications.....	25
Consolidated Index, Volume 3.....	27
Statistical Appendix.....	29

HON. H. A. OLSON, MINISTER—S. B. WILLIAMS, DEPUTY MINISTER

CANADIAN FARM ECONOMICS is published bi-monthly by The Economics Branch, Canada Department of Agriculture, Ottawa. Its purpose is to provide farmers, research and extension workers, government administrators and agribusiness organizations with information on current economic developments in Canadian agriculture. Articles or other material appearing herein may be reproduced without permission provided credit is given to the source.

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CANADIAN FARM ECONOMICS

COMMODITY REVIEW

RECENT HIGHLIGHTS OF THE CANADIAN BEEF CATTLE INDUSTRY

For 1968, inspected slaughter (beef gradings) in Canada totaled 2,784,399 head, 5.4 per cent above 1967 and an all-time record. Most of the increase was accounted for by the ever increasing fed cattle slaughter. Choice and Good cattle slaughtered totaled 1,582,233 head in 1968, 8.4 per cent more than in 1967 and the highest on record (Table 1). These top two grades of beef constituted 57 per cent of total inspected slaughter in 1968. Moreover, in terms of quantity of beef these grades accounted for about two-thirds of the total beef tonnage produced in 1968.

During the past two decades, the relative importance of beef cattle in Canada's farm economy has increased and this trend continued in 1968. In 1967, for example, farmers and ranchers received \$922.3 million from the sale of cattle and calves, about 21 per cent of total farm income. The latest information available indicates that farm income from cattle and calves in 1968 may exceed \$1 billion and will probably amount to a quarter of the total farm income in Canada. This will make the beef industry in Canada the most important single source of farm cash income, as it is in the United States. Increased beef production from feed lots has been a key factor contributing to increased income from cattle and calves.

Canadian cattlemen operate on and are part of the North American beef market. Fed cattle prices in Canada are tied directly to the level of fed cattle prices in the larger United States market. When the

supply of fed cattle in Canada is more than the domestic market will absorb the price of fed cattle will drop to the equivalent of the return from export to the United States. This happened in August 1964, when fed cattle prices in Canada went to a full "export basis" and remained close to or at an export equivalent until August 1966, a period of two years (Figure 1). When fed cattle prices in Canada are on an "export basis" the price for Canada Choice steers at Toronto in Canadian dollars is about the same as for United States Choice steers at Omaha in United States dollars. When this situation prevails, the general price level of fed cattle in the United States sets a "floor" below which fed cattle prices in Canada do not drop.

When Canada's supply of fed cattle is less than the domestic market demand, the price may move up to a level where live slaughter cattle may be imported from the United States.

For example, in September 1966, the price of Choice steers at Toronto went above an export equivalent and by December 1966 to a full "import basis". When price levels for fed cattle in Canada are on the full "import basis" the price for Choice steers at Toronto in Canadian dollars is approximately \$4.50 per 100 pounds higher than the price for United States Choice steers at Omaha in U.S. dollars. Under such a situation the United States price sets a "ceiling" above which fed cattle prices in Canada do not rise.

In 1967, fed cattle prices at Toronto for the first nine months averaged well above an export equivalent and during the last quarter of 1967 went to a full "import basis". During the last quarter of 1967, imports of slaughtered cattle from the United States averaged 1,427 head weekly.

Throughout 1968, the outstanding feature of the Canadian beef market was the willingness of domestic consumers to purchase and consume 30,428 Choice and Good carcasses combined at prices well above an export equivalent. In fact, since August 1966, a period of 28 months, Choice steer prices at Toronto have averaged closer to an

CORRECTIONS

Volume 3, Number 5, December 1968

Page 40, *Duty on United States Corn Imports* — should read "Effective October 31, 1968, . . ."

Page 40, *Farm Credit Act Amendments* — paragraph 2, line 6 should read "... Government of Canada bonds maturing in 5 to 10 years."

Page 40, *Farm Improvement Loans Act Amendments*—paragraph 4, line 6 should read "... bonds maturing in 5 to 10 years."

TABLE 1—AVERAGE WEEKLY GRADINGS OF CHOICE AND GOOD BEEF CARCASSES COMBINED AND PER CENT OF TOTAL GRADINGS, QUARTERLY, 1964 TO 1968

Quarter		1964	1965	1966	1967	1968
1st	number.....	23,863	26,384	25,258	27,600	29,308
	per cent.....	56	54	49	56	56
2nd	number.....	25,001	25,676	27,364	30,088	30,677
	per cent.....	57	54	54	60	59
3rd	number.....	28,248	27,280	28,542	28,740	32,064
	per cent.....	59	49	56	55	58
4th	number.....	24,087	24,418	26,304	25,857	29,662
	per cent.....	46	42	48	50	54
52 weeks	number.....	25,300	25,939	26,867	28,071	30,428
Total	number.....	1,315,612	1,348,871	1,397,080	1,459,714	1,582,233
	per cent.....	54	49	52	55	57

Source: *Livestock Market Review*, Canada Department of Agriculture, Ottawa.

"import basis" than an export equivalent in spite of the continued increase in the production of fed beef in Canada. This is a significant change compared with 1965 when weekly gradings of Choice and Good combined averaged 25,939 carcasses and prices at Toronto averaged close to a full export equivalent.

This strong Canadian beef market has a basis in the rapid increase in population. For example, in just three years, between July 1, 1965 and July 1, 1968, the population of Canada increased by 1.2 million persons. This is more than the equivalent of the current population of either Manitoba or Saskatchewan. In Eastern Canada, where nearly

three-quarters of Canada's population resides the increase during this period was 850,000 persons. In addition, the market gathered strength from the steady increase in the per capita consumption of beef from 69 pounds in 1962 to 82 pounds in 1967. This increase in per capita consumption reflects a buoyant economy and an increasing preference for more beef. This in turn has increased the size and composition of the Canadian beef market.

There was plenty of competition for beef in Canada from other meats in 1968. Per capita consumption of pork in 1968 is expected to average close to the 54 pounds consumed in 1967, the highest since 1959. For 1968, hog gradings in Canada

PRICE PER HUNDREDWEIGHT OF CHOICE STEERS AT TORONTO AND OMAHA (monthly)

\$'s PER CWT.

\$'s PER CWT.

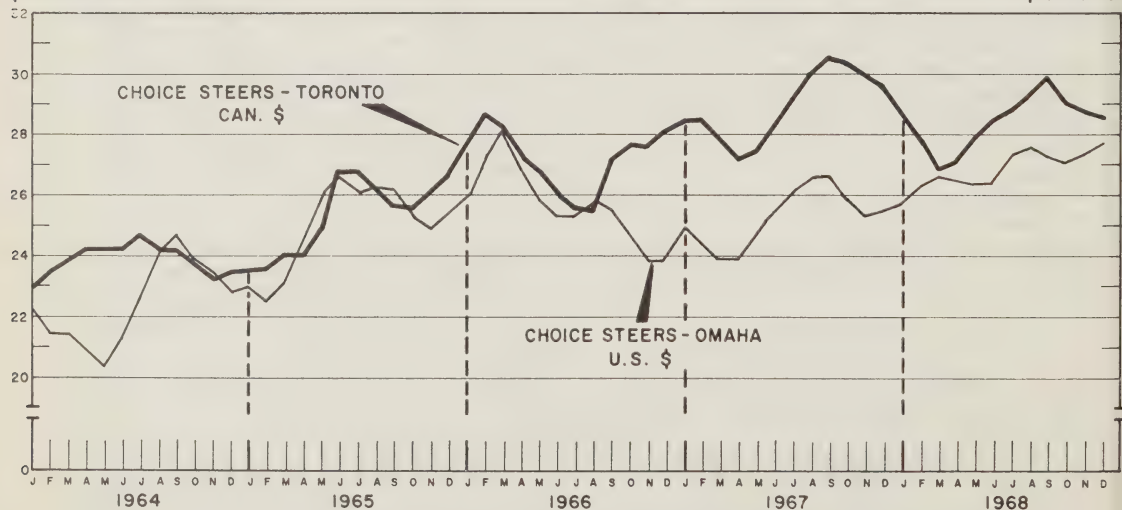


FIGURE 1

totaled 8.1 million head, less than 42,000 head below the high level of 1967 which has been exceeded only twice; in 1944 and again in 1959. Also, poultry meat consumption in 1968 may slightly exceed the record level of 41 pounds per capita consumed in 1967.

In spite of the ample supplies of beef and other meats, the average price of Choice steers at Toronto for 1968 was \$28.45 per 100 pounds compared with \$28.80 in 1967. Choice steer prices at Toronto in 1967 averaged higher than any year since 1951. During this period almost every item of expense in beef production increased, some substantially. The fact that Canadian cattlemen were able to increase beef production sharply reflects the improved management and production methods which took place in the beef industry.

In the United States, the highlight of the beef industry in 1968 was that beef slaughterings averaged about 4 per cent above 1967 with fed cattle prices correspondingly higher. Furthermore, imports of beef and veal were larger in 1968. The average price for Choice steers at Omaha during 1968 is thought to have been about \$26.85 compared with \$25.29 per 100 pounds in 1967. This is the highest annual average price for Choice steers at Omaha since 1962.

In summary, beef supplies on the North American continent were at a record high in 1968. Favorable cattle prices were brought about by strong consumer demand. Beef production in 1969 is expected to be above the previous year's level in both Canada and the United States. In spite of a rapid increase in American beef supplies, the North American continent remains a large net importer of beef. While Canada in general is a net exporter of beef, the United States, the world's largest beef producer, continues to be the world's largest beef importer. This evidence attests to the growing importance and acceptance of beef in American diets.

A. M. Boswell

THE SKIM MILK POWDER SITUATION

Production

The major change in the production of dairy products in Canada in recent years has been the tremendous increase in the output of skim milk powder. Although total milk production has remained at a fairly constant level since 1961, skim milk powder production has increased by about 66 per cent. The main reason for this increase has been the dramatic shift from farmer's deliveries of farm-separated cream to deliveries of whole milk. This shifting has been in response to improvements in the marketing system, difficulties of obtaining labor on the farm, price and availability of animal feeds

and the price of skim milk powder. The result of these changes is that skim milk, which used to be retained on the farm and fed to livestock and poultry, is now manufactured at the factory into milk products such as skim milk powder and casein.

In 1967 and 1968 considerable quantities of skim milk were diverted from the production of casein to the production of skim milk powder. World prices for casein were considerably below the price levels prevalent in 1965 and 1966, when Canada exported, largely to the United States, an average of 16.5 million pounds annually. Since it requires 40 pounds of skim milk to produce one pound of casein but only 11 pounds to produce one pound of skim powder, any large-scale diversion adds greatly to the output of skim powder. (Casein production dropped about 8 million pounds in 1967 from the record peak in 1966.)

Canadian production of skim milk powder reached a record high of 356 million pounds in 1968, compared with the 1960-64 average of 197 million pounds.

Domestic Disappearance

Skim milk powder is a by-product of the butter manufacturing industry, but from a nutritional standpoint it contains the most valuable portion of the milk. The solids-not-fat portion (skim powder) of milk is composed of high quality protein containing all the essential amino acids, lactose (milk sugar) and the essential minerals, particularly calcium. Shifts in consumers' preferences in recent years have favored the solids-not-fat components of milk with the result that the consumption of products such as partly skimmed fluid milk, skim milk powder, cottage cheese and yogurt have increased. Improvements in processing techniques and convenience in packaging have made skim milk powder available to consumers at relatively low prices compared with its nutritive value. Canadians now consume about 38 million pounds of skim milk powder (sold in consumer-size packages) for use in home cooking and for reconstitution as a substitute for fresh fluid milk.

The dairy industry uses considerable quantities of skim milk powder in reconstitution of fluid milk, ice cream, process cheese and cottage cheese. The practice of "enriching" fresh skim milk and partly skimmed milk with skim powder is also absorbing larger quantities of the dry product. In addition, skim powder is used in the confectionery, baking and biscuit industries; in the manufacture of prepared foods such as breakfast cereals and dry cake mixes; in the meat processing industry and in the commercial preparation of canned soups and sauces.

Animal feeds also utilize fairly large quantities of skim milk powder.

Retail prices appear to have had relatively little effect on the sales of skim powder in consumer-size packages, although increases in price may affect the amounts used for animal feeds. The baking industry absorbs about 25 to 27 million pounds of skim milk powder annually. The amount used in the baking industry is fairly constant, however the industry may respond to a price increase in skim powder by cutting back or using whey powder, which is cheaper.

Manufacturers of animal feeds and poultry rations often respond to price increases by substituting cheaper forms of protein such as whey powder, buttermilk powder and soybean protein. The feeds industry currently uses from 16 to 17 million pounds of skim milk powder annually.

Total domestic usage of skim powder in Canada in 1968 was around 160 million pounds, compared with the 1960-64 average of 143 million pounds.

Exports

Since skim milk powder production greatly exceeds domestic usage, the surplus must be exported. Canada normally exports skim powder to some 40 to 50 countries around the world. Exports in 1968 totaled about 101 million pounds compared with the 1960-64 average of 47 million pounds. In addition to commercial sales, Canada donates skim milk powder to the World Food Program and to other United Nations Agencies, directly and through bilateral programs.

The outlook for skim milk powder on world markets is not encouraging. Production has been rising in the principal producing countries, particularly the European Economic Community, Australia and New Zealand. Consumption has not kept pace with the increase in production in these countries, with the result that substantially larger quantities are available for export. Total volume of exports increased 21 per cent in 1967 over the previous year, recording the sharpest gain for any dairy product. Total exports of all major suppliers amounted to approximately 1.8 billion pounds in 1967, compared with about 1.5 billion pounds in 1966. Indications are that trade was increased further in 1968.

One encouraging factor in the international skim milk powder situation is that production in several Western European countries in the latter months of 1968 showed smaller increases over the previous year's levels than during the first half of the year. This was partly attributed to greater use of liquid skim on the farm, encouraged by special price con-

cessions—West Germany, in particular, used increasing amounts of skim milk for feed. There was also a slight decrease in total milk production in some Western European countries during the latter part of 1968, and a trend towards greater cheese production in others diverted milk from butter and skim powder.

The structure of world trade in skim milk powder has changed considerably in the past several years. France and West Germany, which were only minor exporters before 1960, are now the two largest exporters. These two countries and New Zealand accounted for over two-thirds of total commercial exports in 1967. The United States, which for many years was the world's largest exporter of skim powder, has greatly reduced its commercial exports since the end of 1965. United States donations under Public Law 480 are still substantial and totaled 382 million pounds in 1967. (The 1963-67 average was 476 million pounds.) France became the world's leading exporter in 1966.

With the sharp increases in world supplies in 1967, heavy pressures developed on the international market. World prices dropped sharply from around \$408 (Canadian) a metric ton (18.5 cents a pound) in the spring of 1967 to \$216 a ton (9.8 cents a pound) at the end of the year. Offers as low as \$107 a ton (4.9 cents a pound) were reported in the summer of 1968. Major dairy countries, including Canada, with surplus skim powder are endeavoring to dispose of their stocks on international markets with the aid of subsidies.

Canadian export assistance is financed by a hold-back from direct federal subsidy payments made to manufacturing milk and cream shippers. Thus the amount of money necessary to make Canadian skim powder competitive on world markets is reflected in reduced returns to dairy producers.

Although the conversion of shippers from farm-separated cream to whole milk appears to be levelling off, indications are that for several years Canada will have substantial supplies of skim powder that must find an outlet on world markets or be utilized as food aid in developing countries.

V. McCormick

SUGAR

A deficiency payment has been announced of \$5.41 per standard ton of sugar beets marketed by growers in the 1967 crop year. This compares with \$4.83 per standard ton for the 1966 crop. The total cost to the federal government of the 1967 crop

payment is approximately \$5.9 million compared with approximately \$5.8 million in the previous year. Sugar production from the 1967 crop was less than that of the previous year in each province except Ontario, but the price of raw sugar at London, to which the support program is related, was lower than in the 1966 crop year. As a result, the higher deficiency payment was indicated.

The United Nations Sugar Conference adopted a new International Sugar Agreement on October 24, 1968, at Geneva. This Agreement entered provisionally into force on January 1, 1969. For the Agreement to enter provisionally into force certain steps were required to be taken by governments holding 60 per cent of the votes of exporting countries and 50 per cent of the votes of importing countries. These steps were taken in the prescribed time by 8 importing countries representing 59.7 per cent of the importer's votes and by 23 exporting countries representing 72.7 per cent of the exporter's votes.

Negotiation of the new Agreement followed an extended series of consultations, meetings and conferences which ensued upon the collapse of the economic provisions of the 1958 International Sugar Agreement. That Agreement had been for a period of five years, with a review at the end of three years. The 1961 review did not reach agreement on the level of basic export tonnages and limitations on exports for 1962. As a result, the economic provisions of the Agreement ceased to function. However, the administrative provisions were continued by a series of successive Protocols to maintain a vehicle for international study of the world sugar complex and for collection and publication of data on production, trade, stocks, consumption and related matters.

The new Agreement is similar to the 1958 Agreement in that it concerns itself with an attempt to manage world sugar prices through a system of quotas and related provisions. The Agreement contains reference to a number of price levels at which certain agreed events take place, with the aim of strengthening the market when prices are low and moderating upward pressures when prices are high. It is the first major commodity agreement concluded under the sponsorship of the United Nations Conference on Trade and Development (UNCTAD). Co-sponsor was the Food and Agriculture Organization (FAO).

The period since the 1958 Agreement ceased to operate has been characterized by a period of extremely low prices in that part of the world where sugar is traded on a free market. During that period, the London Daily Price of raw sugar, expressed in

Canadian funds, ranged from a high of over 14 cents per pound in November, 1963, to a low of less than 2 cents per pound in January, 1967. Since Canada obtains a very large proportion of its sugar supplies on the free market, the wide fluctuation of sugar prices has had a particular impact on this country.

Under the provisions of the new Agreement, members are classified as either importing members or as exporting members on the basis of their net international trade in sugar. Votes are allotted to each member in relation to its importance in sugar trade, with a minimum of 5 and a maximum of 200 votes for any member. The distribution of votes among members is to be reviewed annually.

Measures for defense of the price are shared between exporting and importing countries with a balance of rights and obligations as between members.

Exporting members are allotted basic export quotas. Early in each year, the International Sugar Council makes an estimate of the import requirements of the free market and this figure is shared among exporting members in relation to their basic export quotas, as an initial export quota. These quotas may be modified to decrease the amount of sugar available to the market when necessary to assist in maintaining the price within a range of 3.25 cents per pound and 5.25 cents per pound. Prices for this calculation are the average of prices at New York and London. The quota mechanism is designed to resist price rises from 4.50 cents per pound upward and to resist price declines from levels of 4.00 cents per pound. At prices above 5.25 cents per pound, all quotas are inoperative and if prices, having been higher, decline to 3.25 cents per pound, automatic quota restrictions apply.

In addition to the quota mechanism, exporting members agree to limit the amount of stocks held and to adjust their production so as to avoid holding year-end stocks of sugar in excess of 20 per cent of production or of basic export entitlement. They also agree to maintain minimum stocks in order to be able to release additional supplies to the market in the event that prices rise above 4.75 cents per pound. Half of the supplies are released when the price goes above 4.75 cents and the other half if prices go above 5.00 cents. At prices above 5.25 cents, priority of supplies is given to members over non-members on commercially equal terms. At prices above 6.50 cents, each importing member has a 30-day option to buy from each exporting member its traditional supplies of sugar at a price no higher than 6.50 cents.

If prices, having been above that level, fall below 3.25 cents, importing members will not import sugar

from non-members and if prices are below 5.25 cents, will not import from non-members more than their average imports of 1966-68. As at January 1, 1969, the absence of India and Fiji from the list of exporting members means that Canada would not permit imports in 1969 from those suppliers beyond their 1966-68 average volume unless they join the Agreement before that limit is reached. The Agreement also provides that if prices go above 3.25 cents and then drop back below that level, imports from non-members would cease. By the first week in January, 1969, the earliest futures contracts which had traded at a price above the lower level of the Agreement were those for December, 1969. Spot prices at New York had strengthened to 3.00 cents per pound.

Certain importing members gave undertakings related to the protection of access to their markets for imported sugar. In this context, Canada undertook that it "will operate its internal policies so as not to provide incentives to sugar production beyond a level representing 20 per cent of domestic consumption."

The obligations of importing members are generally designed to assist exporting members in their efforts to maintain prices within the stated range. Importing members do not undertake to pay exporters the lower target price.

The Agreement contains a number of conditions which are designed to be less onerous on developing members than on developed members.

The Agreement runs for a period of five years, with a review at the end of three years.

E. S. Eaton

POTATOES

The latest estimate of potato production for North America (Canada and the United States) in

1968 was 271 million hundredweights. This is a smaller crop than in 1967, by 3 per cent, but exceeds the 1963-67 average by almost 6 per cent.

Canada

The latest forecast for Canadian production, 51 million hundredweights, indicates an increase of nearly 9 per cent over 1967 and about 5 per cent more than the 1963-67 average. Production was 3 per cent higher than in 1967 in the Maritimes, about 20 per cent more in Central Canada and 6 per cent larger in Western Canada. Since acreage was slightly lower a substantial increase in yields accounted for the larger production.

Domestic movement of potatoes to mid-December 1968 was lower than for the previous year. Unloads on the 12 main Canadian markets dropped by 13 per cent. The domestic movement of Maritime potatoes however was about the same as a year earlier. The export movement to date for the 1968 crop has been substantially better than that of the previous year. To the same date in 1967, exports were just over 1 million hundredweight, whereas to the same date in 1968 exports are more than 1.5 million hundredweight, an increase of 51 per cent. Virtually all of this movement and increase was for Maritime potatoes.

Imports of United States potatoes up to November 1968 were about 45 per cent higher than in the same period in the previous year. There were large increases in unloads in Western Canada particularly in Winnipeg and Vancouver. However, during October 1968 and through to the first half of December the rate of increase slowed considerably.

December 1, 1968, storage stocks of Canadian potatoes (Table 1) were 9 per cent higher than a year earlier and 12.5 per cent more than the 1963-67 average. Disappearance was higher than during 1967 but about the same as the five-year average.

TABLE 1—POTATOES: PRODUCTION, STOCKS AT DECEMBER 1, AND DISAPPEARANCE, CANADA, 1963 TO 1968

Year	Production	Stocks at December 1		Disappearance
		thousand hundredweight		
1963.....	45,604	21,273	24,331	
1964.....	47,733	21,909	25,424	
1965.....	46,472	22,166	24,306	
1966.....	54,679	31,857	22,822	
1967.....	46,743	25,377	21,366	
1968.....	50,904	27,581	23,323	
Average 1963-67.....	48,246	24,516	23,730	

Source: *Monthly Storage Holdings, December 1, 1968*, Canada Department of Agriculture.

Bulk prices to growers for Canada Number 1 grade potatoes in Prince Edward Island and New Brunswick have been much lower than in previous years. December 1968 quotations for New Brunswick potatoes were 1.03 cents per pound compared with 1.06 and 1.21 in December 1967 and Prince Edward Island potatoes were 1.13 cents per pound as compared with 1.20 in December 1967. In Western Canada during the first part of the marketing season declining f.o.b. prices corresponded roughly with the increasing imports. The price dropped well below the 1964-67 average. To counteract this a value for duty — basis \$2.48 per hundredweight — was declared in mid-September on imported potatoes entering Western Canada. This value for duty was lifted on November 2, 1968. In the following weeks Western Canadian f.o.b. prices were fairly steady in most markets.

United States

The December forecast of United States fall production was 220 million hundredweights. This is about 5 per cent less than in 1967 but 5.5 per cent more than the 1963-67 average. Production was

down in the eastern, central and western areas with some important exceptions. North Dakota, a state specializing in potato production, had a larger crop — about 18 per cent above the 1962-66 average. Washington's crop (primarily as a result of the intensive development of the Columbia River basin) was larger, 10 per cent above 1967 and 91 per cent above the 1962-66 average. The Western and Central States production, although less than in 1967 was 14 per cent more than the 1962-66 average. Much of this general increase occurred in Washington, where production rose from 5.9 million hundredweights in 1963 to 15.2 in 1967 and to 16.7 in 1968.

Storage stocks for the United States (Table 2) as at December 1, 1968 were 6 per cent lower than a year earlier but 6 per cent higher than the 1963-67 average. Eastern storage stocks were slightly less than at December 1, 1967. Central States stocks were slightly higher, with North Dakota about 19 per cent higher than in 1967 and 112.5 per cent higher than the 1965-67 average. Minnesota stocks were 13 per cent higher than in 1967 and 109 per cent of the 1965-67 average. The Western States total storage stocks were below 1967 and about 96 per cent of the 1965-67 average.

TABLE 2—UNITED STATES FALL CROP POTATOES: PRODUCTION, STOCKS AT DECEMBER 1, AND DISAPPEARANCE, 1963 TO 1968

Year	Production	Stocks at December 1	Disappearance
thousand hundredweight			
1963.....	198,195	136,995	61,200
1964.....	174,491	114,550	59,941
1965.....	216,809	147,070	69,739
1966.....	227,787	152,640	75,147
1967.....	231,224	161,710	69,514
1968.....	220,018	151,385	68,633
Average 1963-67.....	209,701	142,593	67,108

Source: *Total Potato Stocks on December 1, 1968*, United States Department of Agriculture Statistical Reporting Service, Pot 1-2 (12-68).

TABLE 3—POTATOES: TOTAL PRODUCTION, STOCKS AT DECEMBER 1, AND DISAPPEARANCE, CANADA AND UNITED STATES, 1963 TO 1968

Year	Production	Stocks at December 1	Disappearance
thousand hundredweight			
1963.....	243,799	158,268	85,531
1964.....	222,224	136,459	85,765
1965.....	263,281	169,236	94,045
1966.....	282,466	184,497	97,969
1967.....	277,967	187,087	90,880
1968.....	270,922	178,966	91,956
Average 1963-67.....	257,947	167,109	90,838

Combined Canada and United States stocks (Table 3) were 4 per cent lower than 1967 but 7 per cent higher than the 1963-67 average.

In July and August, 1968, Washington Norgold f.o.b. prices were well below those of the previous year and some were quoted as low as \$1 per hundredweight. F.O.B. prices for fall varieties in Western United States rose in September and October and were steady to the end of 1968 except in North Dakota and for a "Non-size A" grade in Washington. On the other hand Maine's prices were fairly steady to the end of 1968.

Although the 1968 North American potato crop is smaller than in 1967, the United States crop is 10 million hundredweights greater than the 1963-67 average; an amount equal to about 21 per cent of the average Canadian crop.

The United States winter potato production, the marketing of which usually takes place between November and April is about 3 per cent more than last year's and about equal to the average of the past 5 years.

Summary and Conclusions

Storage holdings of potatoes in the U.S. are about average, but those in Washington have reached record levels and Minnesota and North Dakota holdings are higher than normal. Significant quantities of these potatoes may be marketed in Canada.

The Canadian export movement to mid-December, 1968 has been somewhat better than to that date in 1967. However, the United States table potato quota, under which the duty on Canadian potatoes is half-rate, was filled by mid-December. Thus exports to that country face the full tariff rate of 75 cents per hundredweight for the balance of the marketing year.

The combination of these circumstances will likely lead to further pressure on Canadian prices which may not show the usual seasonal rise and could even decline.

J. R. Burns

FACTORS AFFECTING CANADA'S COMPETITIVE POSITION IN WORLD TRADE IN OILSEEDS

Canada has a substantial import and export trade in oilseeds and oilseed products. As a result of the technological developments that introduced the hydrogenation and deodorizing processes, the previous advantages that some oils had have been reduced, and the supply position of a great number of

oils and fats on world markets is now of great significance to Canada's trading position. With respect to trade, the main increases have occurred in soybeans, sunflowerseed and rapeseed; three crops which are grown in Canada. At the same time, trade in some oils has decreased, particularly in palm, palm kernel and cottonseed oils. The most significant development in world oilseed trade has been the rapid expansion which has put sunflower oil into fourth place in world trade among oils, compared with tenth place in 1964.

Stocks of fats and oils have been accumulating since 1964 because the large production of that season could not be absorbed by the market. A build-up of stocks occurred in sunflowerseed, soybeans, rapeseed, fish oil and butter. By 1967 peanuts also were in surplus supply. The pressure on the market from these supplies was only partially offset by decreases in available supplies of palm kernels, palm oil, copra and coconut oil.

Recent oil prices on the world market compared with average prices for the five years 1963-67 are shown in Table 1. While there was some degree of recovery in prices of oils in late 1968, prices of all of the vegetable oils produced in Canada except linseed are still at least 25 per cent below 1963-67 average levels. At the same time the lauric group prices dropped appreciably in late 1968.

One phenomenon in recent years is the change in the price relationship between oils and meals. Prices of soybean oil and rapeseed oil have fallen further than the prices of the seeds from which they were derived. At Rotterdam on December 3, 1968, the price of soybeans was only 7 per cent and the price of rapeseed only 17 per cent below the respective average price for 1967 compared with a decrease of about 25 per cent for the oils. For a number of years the trend has been for the demand for meals to be strong and the demand for oils to be weak.

Soybean production in the United States has been outgrowing utilization in the past few years. It is estimated that stocks in that country may be as high as 300 million bushels at the end of the current crop year, that is September 1, 1969. World market supplies of cottonseed oil which had decreased in 1966 and 1967 are expected to be much higher in 1968-69, with a 45 per cent increase in United States supplies. Sunflowerseed production in the U.S.S.R. was expected to be down sharply in 1968, but recent estimates have indicated that total production may come very close to the 1967 level. However, consumption of oils and fats in the U.S.S.R. is increasing, stocks probably have been reduced and the supplies available for marketing are likely to be lower in 1969.

Total world rapeseed production in 1968 may be down very slightly from 1967. With respect to 1969 production, plantings in France and West Germany increased quite sharply in 1968. Olive oil stocks are still rising and are now reaching burdensome proportions. Although dry conditions in several countries have reduced potential increases, the estimate for Spain is for a sharp increase in production in 1968. Among the laurics, palm oil prices shared in the general price collapse although world supplies had declined sharply. The Nigerian war was responsible for some decrease in world supplies. Copra and coconut oil supplies on world markets, which largely come from the Philippines and islands in the area, were lower than normal in 1966-67 but supplies are starting to improve and prices have returned to more normal levels. World supplies of peanuts were expected to be up sharply in 1968 even though Senegal and Nigerian production is not expected to reach the high levels of the first estimates. World demand for peanuts has changed very little for a number of years. Whale and more particularly fish oil stocks are expected to be lower following reduced catches in 1968. Butter stocks on the other hand became more and more burdensome during 1968. Linseed oil production is sharply up from the low levels of 1967, but world stocks have decreased and it would appear that much of the increased production can be absorbed.

Various government policies have affected production and marketing of oilseeds and oilseed products. The United States price support on soybeans, currently at U.S. \$2.50 per bushel, in a general way has been acting as a floor price for Canadian soybeans, although in the fall of 1968 some United States beans were sold for cash at prices below \$2.50. While this policy has assisted in maintaining Canadian prices, it may have been to some extent responsible for the United States oversupply which in turn tends to keep prices from going much above the support level.

As part of the GATT Kennedy Round negotiations Britain removed the 5 per cent duty on soybeans from the United States and other non-Commonwealth countries. Both Canadian and U.S. soybeans now enter Britain duty free. Canada's sales of soybeans to Britain during the first 9 months of 1968 were lower at 64 million pounds compared with 116.7 million pounds for the corresponding period in 1967. About the end of November 1968 Britain imposed a provisional duty of £4 per long ton on imports of Polish and East German rapeseed. The measure was taken to protect domestic growers against dumping.

Since July 1967, the European Economic Com-

munity has had a common price for oilseeds with a "target price" of \$202.50 per metric ton for rapeseed and an intervention support price of \$192.50. An offset subsidy is paid to processors, equal to the difference between the "world" price and the target price. This subsidy which approximates \$100 per ton, has undoubtedly been an important factor in the sharp increases in the area planted to rapeseed in France and West Germany. The support level may be slightly reduced in 1969 but will still be well above world trading price levels which have been around \$100 per ton.

In July 1967, Italy also imposed a special tax on Italian rapeseed imports. In the period January-October 1967 Canada exported about 3.5 million bushels of rapeseed to Italy; in the same period in 1968 exports decreased to less than one-tenth of that amount. The outlook for the resumption of Canadian rapeseed exports to the EEC market in the immediate future is not an optimistic one. In addition, a proposal is being studied by the EEC which would impose a tax, perhaps as high as \$60 per ton on vegetable and animal fats and \$30 per ton on meals to compensate for price decreases since 1964-65. This could have a serious impact on world trade.

One of the most significant developments for Canada has been the drive for markets for sunflowerseed oil by the U.S.S.R. and other eastern European countries, and the consequent entry into Canada of this oil at low prices. Canadian imports of sunflower oil in 1967 were 34 million pounds, the first time that significant sunflower oil imports were made. Canada crushed about 17 million pounds of sunflower seed in 1967, compared with about 12 million in 1966. Imports of oil occurred at low prices particularly to the end of September 1968, but prices since then have been strengthened by about 1.5 cents per pound from about 7.75 cents f.o.b. basis. So far there are few indications that prices as low as those of mid-1968 are likely to recur in 1969. A compensatory tax on sunflower oil from Eastern Europe has recently been reduced from \$40 to \$25 per ton by the European Economic Community, indicating a slackening of pressure on world prices.

Japan, which is Canada's main market for rapeseed, has a quota system which limits the total amount of rapeseed imported, although Japanese rapeseed production is decreasing each year. At the same time, the Kennedy Round reduction by Japan in the duty on soybeans may lead to greater use of this product, which in meal form at present, is more valuable in livestock feeding than rapeseed. This could favor U.S. soybean exports at the expense of sales of Canadian rapeseed.

TABLE 1—PRICES OF OILS AT ROTTERDAM, 1963-67 AND 1968

Commodity	1963-67	June 1968	Percentage Change from 1963-67 Price	December 3, 1968	Percentage Change from 1963-67 Price
U.S. dollars per metric ton					
Soybean oil.....	236	178	-24.6	177	-25.0
Sunflower oil.....	251	162	-35.5	180	-27.5
Peanut oil.....	297	272	- 8.4	296	0
Rapeseed oil.....	225 ^a	150	-33.3	159	-29.3
Olive oil (Spanish).....	694	677	- 2.5	n.a.	—
Coconut oil.....	291	367	+26.1	304	+ 4.5
Palm kernels (Nigerian).....	160	194	+21.3	165	+ 3.1
Palm oil (Malayan 5% bulk).....	229 ^a	175	-23.6	145	-36.7
Butter (UK).....	878	709	-19.2	709 ^b	-19.2
Fish oil (Peruvian, semi-refined).....	186	100	-46.2	110	-40.9
Linseed oil.....	189	237	+25.4	219	+16.2

n.a.: Not available.

^a 1966 and 1967 only.

^b Second half of November.

Source: Various United States and European publications.

The implications for Canadian vegetable oils of the existing world oils and fats situation may be summarized as follows:

1. Imports of oils from Europe should not be a serious factor in 1969. With lower Canadian rapeseed prices, imports of rapeseed oil had practically ceased in 1968 and are not likely to increase. Sunflower oil imports at the depressed prices of 1968 are not likely to occur, although imports at higher prices may occur as Canadian consumption of edible vegetable oils continues to rise. The very low price level of soybean oil could lead to increased imports of this commodity.

2. Exports of soybeans from Canada to Britain presumably will continue to decline due to the increased competitive position of U.S. soybeans. This has resulted from the removal of the United Kingdom duty and also from the fact that soybeans from parts of the United States can be delivered to Britain at lower transportation costs than from Canada. Prospects for the export of rapeseed to the European Economic Community are not good, but rapeseed exports in total may not decline because of a growing market in Japan and Taiwan. Linseed oil exports from Canada declined in 1968 but should improve somewhat in 1969 while world stocks are replenished.

The effects of the excessive world supply of fats and oils are likely to continue in 1969 and policies of

various countries will probably continue to take this situation into account. New developments may occur of significance to Canadian soybean growers. In each of the last five years substantial increases have occurred in United States soybean production. In 1968 the crop was 1,080 million bushels, more than 100 million bushels greater than the previous year. Stocks, which at September 1, 1968, were 167 million bushels are expected at the same time in 1969 to be about 300 million bushels, and to add substantially to the world oversupply of oils and fats. The Government of the United States has not announced its support program for 1969 and to prevent continuation of the extreme surplus situation, has to decide among several courses of action. The support price of \$2.50 could be reduced and this would have a direct impact on Canadian soybean prices, and possibly on the price structure of edible oils and fats on Canadian and world markets generally. Alternatively, the support price could be maintained but production controls introduced for the first time on soybeans. Another possibility is a combination of acreage control and a reduced support price. In any event, the decisions made are likely to have an important impact on the fats and oils situation for Canada.

J. S. Carmichael

AGRICULTURAL DEMAND SUPPLY PROJECTIONS FOR 1980

Zenon Yankowsky

The results presented in this paper are not forecasts of the most likely food demand and supply situation in Canada. This is a projection exercise, that is, an attempt to quantify the food supply and demand situation in 1980 on the basis of specified assumptions and reasoned extrapolation of supply and demand trends and the factors affecting them. The purpose is to study the situation towards which current trends appear to be moving.

The study has been made on the assumption that present policies remain basically unchanged, and the prices and costs will continue to develop in approximately the same way as in the recent past. The production projections are largely based on the continuation of recent trends under the general assumptions indicated above concerning policies and prices. Projections of demand and supply are independent of each other and no attempt has been made to balance supply and demand.

With regard to trade, we have to keep in mind that there are no simple and reliable techniques for projecting future levels of exports, which are certain to be affected by unpredictable changes in world economic conditions by governmental actions restricting or accelerating international trade in agricultural products.

Bearing in mind these qualifications we feel that the broad results of these projections are valid and are of significance.

DOMESTIC DEMAND FOR FARM PRODUCTS Food Uses

There are many forces that influence the demand for food in Canada. These include population and income growth, technological changes which affect our way of living, foreign markets, and shifts in consumer preferences due to new products and changing price situations. Among all these forces, population and income play a dominant role. While population growth has a direct impact on the quantity of food consumed, higher income per capita tends to have greater influence on the composition of the food basket and the quality of food consumed. This income effect is the kind of change which is expected to significantly influence the demand for food in Canada.

To make these projections, certain basic assumptions have been made (Table 1). Population projections for 1980 are based on these made by the Economic Council of Canada (1). Specifically, the projections for total population represent the midpoint between the high and medium projections made by the Economic Council.

According to these estimates Canada's population will total 26 million in 1980, an increase of 27.7 per cent from 1967. The projected average annual growth rate of population will be 1.9 per cent. In the last 15 years the growth rate averaged 2.4 per cent a year.

TABLE 1—POPULATION AND INCOME, SELECTED PERIODS, 1949 TO 1966, AND PROJECTIONS FOR 1975 AND 1980

	1949-51	1959-61	1964-66	1975	1980	1980 as per cent of 1964-66
			thousands			
Population (at June 1).....	13,722.6	17,863.6	19,649.6	23,710	26,050	132.6
Total (1957 constant dollars)			billion dollars			
Gross National Product.....	23,090	34,226	44,672	72.8	90.3	202.1
Disposable income.....	15,452	23,808	30,862	50.5	62.9	203.8
Expenditure on goods and services.....	14,307	22,406	28,400	46.3	57.8	203.5
Expenditure on food.....	3,574	5,481	6,206	9.0	10.7	172.6
Per Capita (1957 constant dollars)			dollars			
Gross National Product.....	1,682	1,916	2,273	3,070	3,466	152.5
Disposable income.....	1,126	1,333	1,569	2,130	2,415	153.9
Expenditure on goods and services.....	1,042	1,254	1,445	1,953	2,219	153.6
Expenditure on food.....	260	307	316	378	410	129.6
			per cent			
Food as per cent of disposable income.....	23.1	23.0	20.1	17.7	17.0	

Sources: (1) For the years 1949-66, the Dominion Bureau of Statistics.

(2) Projections for 1975 and 1980 are based on the *Fourth Annual Review* of the Economic Council of Canada, published in September 1967.

The Economic Council (2) published trends on the average growth of total employment and the average growth of productivity (that is, output per employed person). These two principal elements have been used as a basis for projections of Gross National Product to 1980. Projections of disposable income were estimated on the basis of the average relationship with Gross National Product during the past 15 years.

According to these projections the Gross National Product, expressed in 1957 constant dollars, will reach \$90 billion in 1980, about 84 per cent higher than in 1967. Disposable income, expressed in the same constant dollars, will be \$63 billion and will represent close to 70 per cent of the Gross National Product.

Expenditure on Food—Total food expenditure as a per cent of consumer disposable income is projected to continue its long-term decline from 23 per cent in the 1956-61 period to about 17 per cent in 1980. In dollar terms, however, consumer expenditure for food should rise from \$6.7 billion in 1967 to about \$10.7 billion in 1980, an increase of almost 60 per cent.

However, the large increase projected for per capita food expenditure does not signify a proportionate increase in quantity of food consumed, although there will be an increase in consumption of the higher valued foods such as meats, fruits and vegetables. Most of the expansion in consumer outlays will be accounted for by such factors as higher marketing costs, greater use of convenience food (involving more services such as freezing and packaging); and more eating in restaurants.

Consumption of Crop Products—A marked upward trend is evident in the consumption of fruits and vegetables as a group and also for oils and fats of plant origin.

The increase in the consumption of fruits and vegetables is associated with higher incomes, which typically result in the purchase of a more varied diet and a decline in calorie intake. The upward trend for vegetables is somewhat more pronounced than for fruits, but at the same time both groups show a steady shift from fresh to processed forms (canned and frozen). The proportion of all fruits consumed in processed form rose from 41 per cent in 1949-51 to 47 per cent in 1964-66. During the same period, processed vegetables rose from about 46 per cent to about 51 per cent of total vegetable consumption.

The increase in consumption of oils and fats, (excluding butter), shows a shift in consumption from products of animal origin to those of vegetable origin. This is apparently due to a combination of

price advantages enjoyed by the latter, development of synthetic and substitute products and health considerations. If, in addition to butter, lard is excluded from this series, the upward trend is further accentuated. On the other hand, the per capita consumption of all oils and fats, including butter, has shown little change throughout the period since the end of World War II.

The decline in the consumption of cereals and potatoes is a trend of long duration, reflecting shifts to other types of food as income rises. The decline in cereals is dominated by wheat flour, while the decline in potatoes is due to the decrease in fresh potato consumption. On the other hand, the consumption of processed potatoes (frozen, canned, chips and dehydrated) has been increasing in recent years, so that the downtrend in the per capita consumption of potatoes as a whole appears to be leveling off.

Consumption of Livestock Products—Per capita consumption of red meat increased from 129.8 pounds in 1949-51 to 149.3 pounds in 1964-66. This has been almost entirely because of the strong upward trend in beef consumption which reflects rising incomes and a strong consumer preference. Pork consumption has shown a moderate decline for the period as a whole, although it has been relatively stable during the 1960's.

The consumption of poultry has had a spectacular rise, increasing from an average of 16.5 pounds per capita in 1949-51 to 37.1 pounds in 1964-66; chicken consumption has almost doubled, from 13.7 pounds in 1949-51 to 26.8 pounds in 1964-66; while turkey consumption has almost quadrupled from 2.5 pounds per capita to 9.5 pounds during the same period.

Per capita consumption of eggs increased from 29.0 pounds in 1949 to 37.5 pounds in 1957, but since then declined to an average of 31.7 pounds in 1964-66. The reasons for the decline are not completely clear, but dietary and medical recommendations for a reduced use of animal fats appear to have been a contributing factor.

The consumption of dairy products has been declining throughout the postwar period. In terms of total milk equivalent, per capita disappearance declined 12 per cent between 1949-51 and 1964-66. The items chiefly responsible for the decrease have been fluid milk and cream, creamery butter and manufactured whole milk products, particularly evaporated milk. Partially offsetting this decrease have been increases in 2 per cent fluid milk, cheese, ice cream and manufactured milk by-products, notably skim milk. Here again, the changing consumption pattern results from the interaction of a rather complex set

of forces, but the trend away from animal fats and the price advantages of competing products appear to be influential. The rising consumption of soft drinks and dairy product substitutes may be a factor in the decline of fluid milk consumption; while, for ice cream, rising consumer incomes and the expansion of improved household refrigeration facilities appear to be important.

Consumption Projections to 1980—The principal method for estimating per capita consumption in the future was to calculate the relation between percentage changes in food consumption per capita and those in disposable income per capita, and then to project these relationships from 1964-66 to 1975 and 1980 on the basis of the overall economic assumptions for those years. However, the results of this procedure were subject to modification on evidence from observed trends, specialized commodity studies, and related work in the field of long-range projections done by others, such as Food and Agriculture Organization (FAO), the Organization for Economic Co-operation and Development (OECD),

and the United States Department of Agriculture (USDA).

Per capita consumption of principal foods in Canada for selected periods between 1949 and 1966 and projections for 1975 and 1980 are shown in Table 2.

The total weight of the food basket consumed per capita in 1980 will show practically no change from 1964-66. There will however, be a major change in the quantity of the components constituting this food basket. It is estimated that there will be substantial increases in consumption of meats, oils and fats of plant origin, fruits and vegetables, cheese, ice cream and concentrated milk by-products (3). On the other hand decreases are indicated for fluid milk, cream, butter, eggs, cereals, potatoes, and pulses and nuts. Virtually no change is projected for sugar and syrup.

In the meat group the increase is due to greater consumption of poultry and beef and in the fruits and vegetables group the increase is because of greater consumption of processed products.

TABLE 2—PER CAPITA FOOD CONSUMPTION, SELECTED PERIODS, 1949 TO 1980

Commodity	Unit	Average 1949-51	Average 1959-61	Average 1964-66	1975	1980	1980 as per cent of 1964-66
pounds							
Cereals—Total.....	retail weight	171.7	153.0	153.0	140.0	136.0	88.9
Wheat and rye flour.....	retail weight	153.1	135.6	133.6	121.0	116.0	86.8
Sugar and Syrups.....	retail weight	109.5	108.9	111.4	111.5	111.5	100.0
Sugar.....	retail weight	99.5	97.8	99.8	100.0	100.0	100.0
Pulses and Nuts.....	retail weight	11.4	10.3	10.2	9.3	9.0	88.2
Dry beans and peas.....	retail weight	5.9	4.5	4.2	3.5	3.2	76.2
Oils and Fats excluding butter....	retail weight	27.5	31.8	32.5	36.5	38.0	116.9
Fruits—Total.....	fresh equivalent	153.0	178.1	183.5	195.0	200.0	109.0
Fresh.....	fresh equivalent	90.2	97.0	97.5	100.0	100.0	102.6
Processed.....	fresh equivalent	62.8	81.1	86.0	95.0	99.0	115.1
Vegetables—Total.....	fresh equivalent	135.4	161.0	170.9	192.0	200.0	117.0
Fresh.....	fresh equivalent	71.8	84.7	85.7	93.0	96.0	112.0
Processed.....	fresh equivalent	63.6	76.3	85.2	99.0	104.0	122.1
Potatoes—Total.....	fresh equivalent	164.3	156.0	155.9	150.0	147.0	94.3
Dairy Products—Total.....	retail weight	450.6	410.7	384.6	351.6	339.6	88.4
Fluid milk.....	retail weight	389.1	344.4	317.8	267.3	248.7	78.2
Butter.....	retail weight	21.9	17.2	18.5	14.0	13.0	70.3
Cheese.....	retail weight	5.5	7.2	9.3	13.1	14.7	158.1
Concentrated whole milk products	retail weight	18.6	19.7	17.8	16.0	15.5	87.1
Concentrated milk by-products....	retail weight	5.6	9.4	12.1	23.4	29.0	239.7
Ice cream.....	retail weight	9.9	12.8	14.4	17.8	19.0	131.9
Dairy Products—Total.....	milk equivalent	1,028.0	895.8	901.7	799.7	765.0	84.8
Meats—Total.....	carcass weight	129.8	141.3	149.3	163.1	168.2	112.6
Beef.....	carcass weight	52.3	68.4	81.0	94.8	100.0	123.4
Veal.....	carcass weight	9.0	6.9	7.4	7.0	6.9	93.2
Pork.....	carcass weight	56.2	53.1	49.6	50.0	50.0	100.8
Lamb and mutton.....	carcass weight	2.3	3.1	3.3	3.3	3.3	100.0
Other meats.....	carcass weight	10.3	9.9	8.0	8.0	8.0	100.0
Poultry.....	eviscerated weight	16.7	29.7	37.1	45.7	49.0	132.1
Eggs.....	fresh equivalent	29.5	34.5	31.7	29.4	28.7	90.5
TOTAL.....		1,399.4	1,415.3	1,420.0	1,424.1	1,427.3	100.5

Source: Dominion Bureau of Statistics, for 1949-1966. Projections for 1975 and 1980, estimated by Economics Branch, Canada Department of Agriculture.

TABLE 3—TOTAL FOOD CONSUMPTION, SELECTED PERIODS, 1949 TO 1980

Commodity	Unit	Average 1949-51	Average 1959-61	Average 1964-66	1975	1980	1980 as per cent of 1964-66
				million pounds			
Cereals—Total.....	retail weight	2,356	2,733	3,006	3,319	3,543	117.9
Wheat and rye flour.....	retail weight	2,101	2,422	2,625	2,869	3,022	115.1
Sugar and Syrups.....	retail weight	1,503	1,945	2,189	2,644	2,905	132.7
Sugar.....	retail weight	1,365	1,747	1,961	2,371	2,605	132.8
Pulses and Nuts.....	retail weight	156	184	220	200	234	117.0
Dry beans and peas.....	retail weight	81	80	82	83	83	101.2
Oils and Fats excluding butter.....	retail weight	377	568	639	865	990	155.0
Fruits—Total.....	fresh equivalent	2,100	3,182	3,606	4,623	5,210	144.4
Fresh.....	fresh equivalent	1,238	1,733	1,916	2,371	2,605	136.0
Processed.....	fresh equivalent	862	1,449	1,690	2,252	2,579	152.6
Vegetables—Total.....	fresh equivalent	1,858	2,876	3,358	4,552	5,210	155.1
Fresh.....	fresh equivalent	985	1,513	1,684	2,205	2,500	148.5
Processed.....	fresh equivalent	873	1,363	1,674	2,347	2,709	161.8
Potatoes—Total.....	fresh equivalent	2,255	2,787	3,063	3,556	3,829	125.0
Dairy Products—Total.....	retail weight	6,182	7,337	7,557	8,265	8,855	115.8
Fluid milk.....	retail weight	5,480	6,000	6,076	6,337	6,479	106.6
Butter.....	retail weight	300	307	350	332	339	96.8
Cheese.....	retail weight	75	129	183	311	383	209.3
Concentrated whole milk products	retail weight	255	352	350	379	404	115.4
Concentrated milk by-products.....	retail weight	77	168	238	555	755	317.2
Ice cream.....	retail weight	136	229	283	422	495	174.9
Dairy Products—Total.....	milk equivalent	14,227	15,839	17,527	18,960	19,928	113.7
Meats—Total.....	carcass weight	1,781	2,524	2,934	3,867	4,382	149.3
Beef.....	carcass weight	718	1,222	1,592	2,248	2,605	163.6
Veal.....	carcass weight	124	123	145	166	180	124.1
Pork.....	carcass weight	771	948	975	1,186	1,302	133.5
Lamb and mutton.....	carcass weight	32	55	65	78	86	132.3
Other meats.....	carcass weight	141	177	157	190	208	132.5
Poultry.....	eviscerated weight	229	530	729	1,084	1,276	175.0
Eggs.....	fresh equivalent	405	616	623	697	748	120.1
TOTAL.....		19,203	25,282	27,904	33,765	37,181	133.2

Although per capita consumption of cereals and potatoes is projected to decline, it appears that the rate of decline is leveling off.

The interaction between the projections of per capita consumption and the projected population increase are shown in Table 3 as projections for total consumption of the principal food commodities.

Very large increases in total consumption are indicated where per capita consumption is trending upward. For example, fruits and vegetables would rise by 44 per cent and 55 per cent respectively; meats by 49 per cent; oils and fats by 55 per cent; and poultry by 75 per cent. Even for most products where the per capita trend is down, total consumption would rise significantly. For example, cereals would be up 18 per cent; potatoes, 25 per cent; dairy products, 16 per cent; and eggs, 20 per cent.

Non-Food Uses

In addition to the export and domestic food demand, agricultural products also enter non-food uses such as feed, seed and industrial uses.

In 1964-66, approximately 80 per cent of all cereals

available for domestic utilization were used in animal feed compared with about 7.5 per cent for direct human food and about 12.5 per cent for seed and industrial uses. When human food is expressed in net terms and milling by-products are added to animal feed, consumption of grains in terms of livestock products is about 85 per cent. Expressed in bushels, domestic utilization of grains in 1964-66 was as follows: food, 67 million bushels; seed, 78 million bushels; industrial uses, 38 million bushels; and feed, 700 million bushels.

Grain requirements for 1980, have been projected in the following way. Seed requirements were calculated by applying the seeding rates per acre for each grain used in 1964-66 to the projected crop areas in 1980. For industrial uses, a continuation of past trends with some adjustments was assumed in most cases. Feed requirements have been worked out on the basis of the projected total number of consuming animal units and the amount of feed grains fed per animal unit.

Because the exact course of feeding rates per animal unit is very uncertain, there are two projected requirements for feed grains. The first is based on

the assumption that there will be only a slight increase in the amount of grains consumed per animal unit, in line with the postwar trend. The second requirement is based on the assumption that there will be a marked increase in the amount of grains consumed per animal unit. This approach takes into account present feeding practices aiming at an accelerated finishing period for animals and the favorable feed-livestock price ratio, which is expected to continue.

On the basis of these two approaches feed requirements should increase from 700 million bushels in 1964-66 to 860 million to 960 million bushels in 1980, an increase between 23 and 37 per cent. Increases in grain requirements for other uses will be much smaller and they are likely to be as follows: food about 10 million bushels, seed about 3 million bushels and industrial uses about 13 million bushels.

EXPORT DEMAND

Canadian farm exports move to about 130 countries, with some 200 commodities being involved.

On an overall basis, the value of Canada's agricultural exports in 1964-66 averaged \$1.7 billion. This represented over 4 per cent of world agricultural exports and made Canada the second largest agricultural exporter.

During the same period, agricultural exports made up about 20 per cent of Canada's merchandise exports and contributed heavily towards a balancing of merchandise trade.

A review of agricultural exports by commodities and by countries over the past quarter century shows noticeable changes in the proportions of commodities exported and in the direction of trade (4). Grains have become more important. Live animal exports show no percentage change, but meat and dairy products percentages are down. Oilseeds, forage crop seeds and tobacco show gains, with oilseed exports showing the largest increase in share of the commodity export basket.

There has also been a change in the direction of the flow of agricultural products. The best export markets for Canadian agricultural products are the developed countries. However, within this group there have been a number of changes. Western European countries including the United Kingdom are relatively less important than during the pre-World War II period. On the other hand, exports to Japan and the communist countries have increased substantially, although in the case of the latter this increase was mainly because of wheat exports. There are no major commercial export outlets among the less-developed countries.

Export Projections

Many factors influence the trade pattern. To list a few, tariffs, quantitative restrictions, exchange restrictions, bilateral arrangements, income, population, consumption habits, prices, location of the centers of production and consumption, and, last but not least and most difficult to measure, comparative costs.

An additional source of uncertainty is the fact that the major exporters of agricultural commodities, such as Canada, have been faced with the problem of exporting to three different types of markets. These are broadly classified as developed countries, developing countries and communist countries. The countries falling in these groups exhibit different rates of population growth, different stages of economic development, and different policies with respect to agricultural production and trade.

The other side of the coin is that the exporting countries can employ a variety of alternatives to move their farm products into world markets—including not only straight commercial price competition, but such devices as two-price systems, concessional sales, long-term credits, commodity agreements, bilateral trading arrangements and the like. Thus, to the uncertainties surrounding the demands of the importing countries are added uncertainties as to the marketing strategies of the competing exporters.

Lacking a satisfactory analytical basis for projecting export demands, there is a tendency to oscillate between extremes of optimism and pessimism. Fears that population in the less-developed countries will continue to outrun food production lead to projections of rapidly rising levels of world trade in agricultural products, particularly grains, while the belief that major breakthroughs in productivity are imminent in many of these countries implies that there will be serious contraction in world markets for farm products. A common device for handling this problem is to project several different levels of export demand and to indicate the implication of relatively high or low guideposts.

In line with the above, export projections are presented under two assumptions. Under the first assumption the volume of agricultural exports in 1980 would be about a third greater than in 1964-66, with a value of approximately \$2 billion (in 1957 values). An increase of this size would be about in line with the annual average increase of 1.7 per cent in the total volume of agricultural exports in the 15 years 1949-63, prior to the unusual spurt of 1964-66.

Under this assumption wheat exports in 1980 are projected to be about 625 million bushels or 25 per cent above the 1964-66 level. It would imply a wheat crop of about 800 million bushels, 15 percent above the 1964-66 average of 692 million bushels, but approximately 3 per cent below the bumper crop of 1966-67.

Export projections for other agricultural products such as coarse grains, oilseeds and products, tobacco, whole and skim milk powder, animals and meats, fruits and vegetables, seeds for sowing, maple products, were based on several factors that applied separately to each group of products. Total value of these exports is projected to reach about \$850 million, about 40 per cent of all agricultural exports in 1980.

Although this is a substantial increase from the \$1.5 billion of 1964-66, it would be only about 2.2 per cent of the projected Gross National Product in 1980 compared with 2.8 per cent in 1959-61 and 3.2 per cent in 1964-66. This is consistent with the long-term downward trend in the ratio of agricultural exports to Gross National Product, which was interrupted by the unusually high export levels in most years since 1963.

It is also generally in line with a number of long-range projections of world food needs made by FAO, OECD, the USDA and the President's Science Advisory Committee in the United States (5).

Under the second assumption wheat exports were projected to remain at the same level as in 1964-66 (500 million bushels), while exports of other commodities were projected to increase but at a somewhat slower rate than in the first assumption. Projected exports for 1980 would be about \$1.7 billion (1957), about 18 per cent above the 1964-66 level. The rate of growth of agricultural exports under the second assumption would be about 1 per cent per year.

It should again be emphasized that export projections assume the continuation of trends and relationships characteristic of the postwar period as the most feasible basis for establishing an economic benchmark relevant to policy decisions over the next 12 to 15 years. In so doing it is necessary to rule out speculations with respect to such matters as dramatic changes in the technology of farm production, world-wide retreat in agricultural protectionism, abandonment of agricultural aid to the less-developed nations and wars among the major powers. There is really no choice except to project a statistical framework resting on the assumption of some degree of stability in the world economic structure.

Two concluding remarks seem to be in order. Although the importance of wheat in the export picture is manifest, the importance of exports of other farm products should not be underestimated. At the same time, however, (wheat and a few minor products excepted) the basic trend on the demand side is toward a larger domestic market for Canadian farm products and less dependence on export outlets. In 1949, sales of farm products to the domestic market represented about 55 per cent of production; in 1965, domestic sales of these products represented about 65 per cent.

PRODUCTION PROJECTIONS

The production projections were based on extrapolation of the post-war trends and modified where necessary, by subjective judgments. We also assumed that technological developments and improved farm management will continue, as in the past, to influence the production and yields of both crops and livestock. Generally, these projections aim at the continuation of normal production avoiding thus the extremes that could arise because of unusual weather conditions. It should be mentioned, however, that the level of production projected is generally below the potential which could be reached if large export outlets were available.

Commodities analyzed are: wheat, coarse grains, livestock, eggs and milk.

Crops

Because production of wheat is export oriented and depends more on foreign than domestic markets, projections for this crop are extremely tentative. By 1980 production of wheat could easily total 850 million to 900 million bushels and would be only between 23 million and 73 million bushels higher than the bumper crop of 1966-67. Wheat production at this level would be more than enough to meet all the domestic and export requirements projected earlier.

Production of coarse grains is projected to increase from 755.7 million bushels in 1964-66 to slightly more than 1 billion bushels in 1980 or about 34 per cent. Such a production might be sufficient to cover export and domestic requirements based on the assumption of lower feeding rates and might be somewhat short to cover export and domestic requirements based on higher feeding rates. The shortfall could be met by feeding larger amounts of wheat and by smaller exports of coarse grains.

Livestock

Projections of beef and veal production show a significant increase from the 1964-66 period. The 1980 production will be sufficient to cover all domestic requirements. Also, projected production of pork will be in balance with domestic demand but the exportable surplus will be reduced. By 1980 production of mutton and lamb is expected to cover only about 10 per cent of the domestic requirements and the balance would have to be imported. At the present time domestic production covers slightly over 30 per cent of requirements. Poultry meat projections indicate that by 1980 domestic production will be slightly above the domestic requirements. A very similar trend to that of poultry is projected for the production of eggs. Milk production in 1980 is projected to be slightly lower than total demand.

SUMMARY AND CONCLUSIONS

Canada's population in 1980 will likely reach 26 million and will be 33 per cent higher than the average in 1964-66.

Total national income measured in 1957 dollars, will be twice as high in 1980 as in 1964-66, and per capita disposable income will be about 50 per cent higher.

The per capita food basket in 1980 will be practically the same as in 1964-66 in terms of weight, but substantially different in composition. In monetary terms, the food basket will be more expensive but in relation to the level of disposable income it will be cheaper.

In terms of total calorie intake, per capita consumption is projected to decrease slightly but consumption of animal protein and of fats of vegetable origin will increase.

Total domestic food requirements in 1980 are projected to increase over the 1964-66 level by about 33 per cent. However, increases in the demand for individual commodities could range from nil to about 100 per cent.

Between 1949-51 and 1964-66 the volume of total agricultural production increased by about 50 per cent. If this rate of growth is maintained, total volume of farm output in 1980 will be about 40 per cent higher than in 1964-66.

In the 15 years ending in 1964-66 the volume of agricultural exports increased by about 80 per cent. These projections indicate that, depending on the future world agricultural situation, agricultural exports could increase by between 18 and 33 per cent over the 1964-66 level.

These projections show that, on the basis of present policies, agriculture in Canada has a potential to expand its output faster than the growth in domestic requirements. This potential takes the form primarily of greatly increased quantities of wheat which could be available for export. Also, other crops not mentioned specifically have a potential to increase substantially and could be available for export.

These increased availabilities can be achieved without any stimulus to output beyond those given by current policies.

The projections show rising import requirements for mutton and lamb and declining export availabilities for other livestock and livestock products.

These projections indicate that further diversification in Canadian agriculture would be desirable. Such a diversification, that is, less wheat and more livestock, is indicated by recent FAO and OECD projections, which point to future world surpluses of grains and shortages of livestock, especially of beef and veal.

NOTES AND REFERENCES

- (1) Economic Council of Canada, *Fourth Annual Review*.
- (2) Economic Council of Canada, *Fourth Annual Review*.
- (3) The increase projected for the concentrated milk by-products needs to be tempered by the fact that these include condensed skim milk, evaporated skim milk, skim milk powder, powdered buttermilk, and special formula skim milk products.
- (4) For details see Frank Shefrin, *Trends in Canada's Agricultural Trade Pattern*, Canada Department of Agriculture, Ottawa, 1965, and G. A. Hiscocks, *An Analysis of World Wheat Export by Types of Wheat*, *Canadian Farm Economics*, October, 1968.
- (5) Those projections indicated that around 1980, world wheat production will be in the range of 12 billion to 13 billion bushels; Canadian production, 760-950 million bushels (6-6.5 per cent of the world production); Canadian wheat exports, between 570 million and 740 million bushels, or about 25 per cent of world exports.

THE ANTI-DUMPING ACT: IMPLICATIONS FOR CANADIAN AGRICULTURE

M. N. Gifford

In June 1967, Canada signed the international code governing the application of anti-dumping duties which was agreed to during the Kennedy Round of trade negotiations held under the auspices of the General Agreement on Tariffs and Trade (GATT).

Article 6 of the GATT broadly outlines the conditions under which a country may levy anti-dumping duties but in the past there has been no general agreement on the exact interpretation of this Article. The purpose of the Anti-Dumping Code is to clearly elaborate a set of rules which will enable greater uniformity and certainty in the application of anti-dumping duties. "Dumping" is defined to take place when the domestic or "normal" value of goods in an exporting country exceeds the f.o.b. or "export" price paid by an importer.

For some countries, including Canada, the acceptance of this international obligation has required the introduction of new legislation in order to bring domestic laws, regulations and administrative procedures into conformity with the "Code". As a result, the Canadian Government has enacted a new statute (effective January 1, 1969), the Anti-Dumping Act, to deal exclusively with the application of anti-dumping duties. Previously, anti-dumping legislation was found in various sections of the Customs Tariff and Customs Act.

Under the new legislation the Canadian Government must determine whether, as a result of dumping, there has been material injury, threat of material injury or threat of material retardation to the establishment of a Canadian industry before anti-dumping duties can be definitely applied. An Anti-Dumping "Tribunal" consisting of five members appointed by the Federal Government will be responsible for establishing whether any of these conditions have occurred. (The Tribunal will have an analogous function in this respect to that of the United States Tariff Commission.)

In essence, the Anti-Dumping Act will operate in the following manner:

(a) Once a preliminary determination of dumping has been made by the Deputy Minister of National Revenue, the case is referred to the Tribunal to determine if injury has or will result from the dumping.

(b) The Deputy Minister of National Revenue can make a preliminary determination of dumping either as a result of information supplied on the initiative of Government officials or on the written complaint of other interested parties. Once a pre-

liminary determination of dumping has been made, the Deputy Minister may levy a provisional duty or require a deposit to be made by the importer up to such time as the findings of the Tribunal are made known. The value of the provisional duty levied cannot exceed the provisionally estimated margin of dumping.

(c) Goods which entered Canada within the 90-day period prior to the date on which the Deputy Minister of National Revenue made a preliminary determination of dumping may also be liable for duty.

(d) Only if the Tribunal determines that injury has taken place or will take place can dumping duties be definitely levied. The Tribunal must report its finding to the Deputy Minister of National Revenue within 90 days of the preliminary determination. Upon receipt of the Tribunal's decision, the Deputy Minister must make a final determination of dumping.

MAJOR DIFFERENCES BETWEEN PRESENT AND PAST LEGISLATION

(1) Under the former legislation a dumping duty could not exceed 50 per cent ad valorem. Under the new legislation the dumping duty is equivalent to the difference between the normal value (i.e. the domestic price in the country of origin) and the export price—a margin which could be far in excess of 50 per cent of the normal value.

(2) Only Canadian industries which accounted for more than 10 per cent of the domestic market could receive anti-dumping protection under the previous legislation. There is no minimum share of the domestic market requirement under the new legislation. In fact, under the Anti-Dumping Act duties can be applied if the Tribunal determines that dumping is preventing the establishment of a Canadian industry.

(3) Under the former legislation the Canadian Government did not have to formally determine whether or not injury was being experienced by a Canadian industry before applying dumping duties. Under the new legislation even if dumping is proven the Tribunal has to establish that an industry is being or is going to be injured for dumping duties to be levied.

IMPLICATIONS FOR AGRICULTURE

In the past, Canadian agriculture has not been seriously affected by dumping; however, imports of farm products entering at cyclically or seasonally

depressed prices have been a recurring problem. Hence, the major significance of the Anti-Dumping Act to Canadian agriculture is not related to the Act per se but rather to a number of consequential amendments to present Canadian legislation. The adoption of the Anti-Dumping Act was contingent upon certain value for duty provisions of the Customs Act (Sections 39 and 40A (7)) being repealed. Under this legislation the Federal Government could, through an Order-in-Council, place an arbitrary or fixed value for duty on low-priced imports which although not meeting the technical definition of dumping were adversely affecting the Canadian market. That is to say, the Government was able to fix a value to an imported product below which no imports would be allowed to enter without payment of an additional special duty. Recent examples of agricultural imports against which Canada has fixed a value for duty include live turkeys, potatoes and corn.

However, action against imports of agricultural products entering Canada at cyclically or seasonally depressed prices, but not being dumped, cannot be taken under the new Anti-Dumping Act. Instead, as a result of the consequential amendments, action can be taken through an Order-in-Council under a revision of the Customs Tariff (Section 7). The effect of these amendments to the Customs Tariff will be equivalent to the effect of the repealed provisions of the Customs Act.

Under the amended Customs Tariff, products entering Canada at low or distress prices can be liable to a "surtax". The rate of the surtax will be sufficient to remedy the situation and need not be limited to a maximum of 50 per cent ad valorem as was the value for duty. Application of the surtax will be limited to a maximum of 180 days unless the order is approved by Parliament. Previously there was no statutory time limit. Although the levying of a surtax will not be contingent upon a Tribunal-type determination of injury by the Government, it will only be applied, as was the value for duty, under emergency circum-

stances when imports cause or threaten serious injury as specified under Article 19 of the GATT.

There are certain limitations inherent in the application of surtaxes as was the case in the application of values for duty. Under Article 19 of the GATT a country applying emergency import restrictions such as the surtax must consult quickly with those countries whose exports may be affected. If after consultation, agreement has not been reached (e.g. a compensation offer has been rejected) the affected exporting country or countries may suspend equivalent obligations or other concessions. For example, if Canada applied a surtax against imports of table potatoes there is an impairment of the bound Most-Favored-Nation tariff rate of 37.5 cents per hundredweight which was negotiated under the GATT. The effect of the surtax is to increase the effective tariff rate on potatoes; therefore, Canada would have to consult with those GATT members who might be affected by this action.

CONCLUDING COMMENTS

The Anti-Dumping Act specifies the conditions under which dumping duties may be levied in accordance with Canada's obligations under the International Anti-Dumping Code. The importance to Canadian agriculture, however, is not the Act itself but rather the consequential amendments to previous legislation which the promulgation of the Anti-Dumping Act incurred. The repeal of some of the value for duty provisions under the Customs Act and the adoption of a surtax system under the Customs Tariff are really the most significant implications arising out of the new legislation insofar as agriculture is concerned, since agricultural import problems in Canada usually arise out of depressed-priced imports rather than through dumping. The practical equivalence of the value for duty regime and the new surtax scheme would suggest that agriculture has not been significantly affected by the adoption of the new anti-dumping legislation.

THE ECONOMICS OF ETHYL ALCOHOL PRODUCTION WITH PARTICULAR REFERENCE TO POTATOES AS A RAW MATERIAL

G. G. Pearson

This analysis of the comparative costs of producing industrial ethyl alcohol and beverage spirits from various raw materials, is an attempt to fill, in part, a need for consolidation of economic data related to the industrial utilization of agricultural products. In particular, the analysis endeavours to place in perspective the feasibility of utilizing potatoes as a source of ethyl alcohol.

The word "alcohol" unqualified is often used to refer to ethyl alcohol, however the more correct designation is ethanol ($\text{CH}_3 \text{CH}_2 \text{OH}$). Ethanol is an organic compound well known because of its unique properties as a solvent, a germicide, a beverage, an anti-freeze, a combustible liquid, a depressant, and especially because of its versatility as a building block or chemical intermediate for other organic compounds. In general there are two main processes for the production and distillation of ethanol: 1. the synthetic hydration of petroleum products such as ethylene and 2. the fermentation of sugar, starch, and cellulose materials (1). Traditionally beverage spirits in most countries have been manufactured from ethyl alcohol distilled from the fermentation of agricultural products, while industrial ethyl alcohol, either in its pure state or denatured has been manufactured for the most part, from non-agricultural products such as sulphite liquor and ethylene.

Potatoes are rich in starch which can readily be converted into the fermentable sugars maltose and dextrose for production of alcohol. The potatoes may be ground to a slurry in a hammer mill, then cooked and treated with malt or other preparation containing starch-splitting enzymes. Procedures for yeast fermentation and recovery of alcohol are generally similar to those used with other starchy raw materials, such as grains.

United States Experience

In the United States ethanol has been produced at one time or another from many different raw materials. During World War II, when there was a very large volume of industrial ethanol produced in the United States, grain, molasses, wood by-products, and potatoes were the most common raw materials. The synthetic production of ethanol from petroleum products such as ethylene became economically feasible in the 1950's and very rapidly became the chief source of both denatured and undenatured industrial ethyl alcohol. In 1964, 83 per cent of U.S. industrial ethyl alcohol pro-

duction of 340 million U.S. gallons of 190 proof (95 per cent alcohol by volume) was by synthetic processes. The higher and more variable costs involved in the use of more traditional raw materials such as grains has almost precluded their use in industrial alcohol production except in special circumstances.

Utilization of potatoes for ethyl alcohol has never achieved any great degree of commercial importance in the United States, although attempts have been made. For example, a small experimental alcohol plant was owned and operated by the State of Idaho before World War II in an effort to solve the problem of disposing of cull and surplus potatoes. This did not prove to be a profitable or practical venture. In 1944, the War Food Administration conducted more extensive commercial trials of processing surplus potatoes into alcohol as an emergency measure to aid in the war effort. The potatoes were dehydrated in inactive beet sugar plants and the dried product was shipped to alcohol fermentation plants for conversion. Only small quantities were produced under this plan because of technical difficulties in handling and processing potatoes. Although the dehydrated potatoes were approximately equal to corn in alcohol yield the cost of obtaining the dehydrated materials was more than the cost of corn.

Some alcohol plants in the United States installed facilities specifically for handling raw potatoes in dealing with the surplus potato crop of 1946, when large quantities of potatoes were obtainable from the government at low cost and extensive use was made of potatoes for manufacture of both industrial and beverage alcohol. In 1947, 13 per cent of the alcohol produced in the United States was reported to have come from potatoes as compared with 16 per cent from grains. Molasses and petroleum served as a raw material for the remainder of the production. Efforts were made to popularize blended whiskey containing potato alcohol during and for a short time after World War II but U.S. law required that the source of alcohol be shown on the bottle label. Consumer prejudice against potato alcohol precluded its extensive consumption and production ceased when grain alcohol again became readily available after the war.

Except for special applications potatoes are not considered an economical raw material for use in fermentation in the United States. Since potatoes consist of about 80 per cent water they are bulky and

costly to transport and handle. Low grade potatoes such as would be utilized for this purpose are subject to spoilage unless dehydrated. Transportation costs can be minimized by locating the processing plant in a potato producing area but even then the potatoes can not ordinarily compete with black strap molasses or grains in beverage spirit production, or petroleum sources in industrial ethyl alcohol production (2).

European Experience

Although the synthetic process originally developed in the United States in 1930 is having an increasing effect on industrial alcohol production in such countries as the United Kingdom, Denmark and West Germany, most of the overseas production of both industrial alcohol and beverage spirits is still based on the fermentation processes with agricultural products such as potatoes, sugar beets, molasses, grain and fruit acting as the basic raw materials. Sulphite waste liquor is an important raw material for industrial alcohol in some Eastern European and Scandinavian countries.

Many European countries convert potatoes into ethyl alcohol and at one time potatoes were used so extensively for alcohol production in Germany that special types of potatoes containing 18 to 20 per cent starch were developed for this purpose. In addition to their use in industrial alcohol, potatoes are used quite extensively in beverage spirit production, especially vodka, in some European countries.

There seems to be three principal reasons why potatoes have been used more extensively as a source of alcohol in European countries than in the United States: 1. The technology of converting potatoes into beverage spirits is a more highly advanced science in Europe than in the United States. 2. The price of potatoes as a raw material has remained more competitive with the prices of grains, molasses and ethylene in Europe than has been the case in North America. In general the range of raw materials from which alcohol may be produced in Europe is limited, whereas North America has an abundant supply of nearly every possible raw material. Potatoes, especially surplus potatoes have been more readily competitive in the former situation than the latter. 3. Europe has developed a market for beverage spirits distilled from potatoes, whereas North America has not.

Alcohol Production and Sale in Canada

In Canada, the principal raw materials used in the production of beverage spirits and ethyl alcohol are grains, (of which corn is the most important), molasses, sulphite liquor and fruit. Potatoes and petro-

leum products such as ethylene have not been used in Canada as sources of alcohol, although it is reported that in the near future an establishment will be built in Quebec to utilize ethylene in the production of industrial ethyl alcohol. Food and Drug regulations restrict the production of beverage spirits to agricultural raw materials such as grains, fruit, molasses and potatoes, although special liqueurs may be produced from highly purified alcohol distilled from sulphite liquor, sawdust or ethylene. The bulk of non-potable industrial ethyl alcohol currently produced in Canada is derived from sulphite waste liquor, a pulp mill by-product.

There were 23 establishments in Canada in 1966 whose principal business activity was the manufacture of beverage spirits and industrial ethyl alcohol. These establishments are subject to stringent taxation laws which affect operating procedures but generally they are characterized by three main operational aspects: 1. The distillation of spirits which are placed in bond for maturing and thus not sold in the year in which they are produced. 2. The production of non-potable or non-drinkable alcohol for sale in the year in which it is produced. 3. The purchase of matured beverage spirits for bottling and blending for sale in the same year. In addition, several other establishments produced a very small amount of industrial alcohol as a secondary activity (3).

In 1966, beverage spirits produced by all industries amounted to 49.7 million Canadian proof gallons (4). About 93 per cent of this volume or 46.1 million proof gallons was distilled from grain and the remainder from molasses and fruit. In addition 9.7 million proof gallons of industrial denatured and non-denatured ethyl alcohol were produced primarily from sulphite liquor. The major by-products of these distilling processes were fusel oil and distillers grains.

In 1966, the volume of distilled beverage spirits shipped for sale by the distilling industry amounted to 43.5 million proof gallons valued at \$250.7 million for an average return of \$5.76 per proof gallon. In addition, it is estimated that about 8 million proof gallons of industrial ethyl alcohol (including denatured) were shipped by the distilling industry, at a total value of \$6 million or an average value of about 75 cents per proof gallon. The total revenue of the distilling industry from the sale of its products in 1966 was \$263.2 million of which beverage spirits accounted for about 95.7 per cent, industrial ethyl alcohol for about 2.3 per cent and miscellaneous by-products for the remaining 2 per cent.

In 1966, the distilling industry reported the costs for fuel and electricity to be \$3.9 million, the cost for materials and supplies to be \$83.7 million and

salaries and wages to be \$34 million, for total variable costs of \$121.5 million. If the total variable costs are allocated in the same proportions as the sales of products, the total of the variable costs appropriable to the sale of beverage spirits was about \$116.3 million and to industrial ethyl alcohol \$2.8 million, with the remaining costs attributable to the sale of

the by-products. On this basis the average cost of beverage spirits shipped or sold in 1966 was \$2.67 per proof gallon and the average costs of industrial alcohol shipped was 35 cents per proof gallon, exclusive of fixed costs associated with depreciation and interest on investment, storage, advertising and marketing. These figures are summarized in Table 1.

TABLE 1—REVENUE AND COSTS ASSOCIATED WITH THE SALE OF ETHYL ALCOHOL BY THE CANADIAN DISTILLING INDUSTRY, 1966

	Number of Proof Gallons Sold	Revenue			Variable costs	
		Total	Average per Proof Gallon	Per cent of Total	Total	Average per Proof Gallon
	million	million dollars	dollars		million dollars	dollars
Beverage spirits.....	43.5	250.7	5.76	95.7	116.3	2.67
Industrial ethyl alcohol.....	8.0	6.0	.75	2.3	2.8	.35
By-products.....	—	6.5	—	2.0	2.4	—
Total sales.....	51.5	263.2	5.11	100.0	121.5	2.36

Source: Derived from *Annual Census of Distilleries*, Cat. No. 32-206, Dominion Bureau of Statistics, 1966.

TABLE 2—ESTIMATED COMPARATIVE COSTS OF PRODUCTION OF RAW ETHYL ALCOHOL FROM SELECTED BASIC RAW MATERIALS^a

	United States					Canada	
	Black Strap Molasses	Grain Corn	Sulphite Liquor	Wood By-products	Ethylene	Sulphite Liquor	Potatoes
Year of study.....	1960	1950	1950	1950	1965	1966	1965
Input—Output ratio ^b	1.5 gal.	10 lb.	n.a.	27 lb.	3 lb.	n.a.	55 lb.
Cost analysis	Canadian Cents Per Canadian Proof Gallon (57.1 per cent Alcohol By Volume)						
Basic raw material costs ^c	16	38	0	0	12	4	62
Other variable costs ^d	19	17	19	19	11	24	14
Total variable costs.....	35	55	19	19	23	28	76
Total fixed costs ^e	9	14	4	4	6	7	18
Total production costs ^f	44	69	23	23	29	35	94

^a Raw ethyl alcohol may be denatured for industrial uses or in the case of molasses, corn and potatoes further processed into beverage spirits.

^b Quantity of basic raw material which, when processed, will yield 1 Canadian proof gallon of ethyl alcohol solution containing 57.1 per cent ethyl alcohol by volume.

^c Derived from fair market value of basic raw material at time of particular study; excludes cost of other materials and supplies such as malt, water, etc.

^d Includes other materials and supplies, labor, fuel, and other direct operating costs associated with the "conversion" of the raw material to raw ethyl alcohol.

^e Consists of additional charge equal to about 25 per cent of total variable costs to cover costs of management, depreciation, investment, and selling.

^f Estimated total costs of production of raw ethyl alcohol; does not include costs of denaturing for industrial use or further processing for beverage spirits. Denaturing costs are estimated to be an additional 14 cents per proof gallon. Also does not include profit margin associated with manufacturing.

Sources: (1) A. Standen, et al, *Encyclopedia of Chemical Technology*, Vol. 8, 2nd ed., Interscience Publishers, New York, 1963, p. 440.

(2) *Annual Census of Distilleries*, Cat. No. 32-206, Dominion Bureau of Statistics, Ottawa, 1966.

(3) *Outline of a Plant for Producing Alcohol from Potatoes on Prince Edward Island*, 1965.

It should be noted that the average cost figure of 35 cents per gallon for industrial ethyl alcohol is for both denatured and non-denatured alcohol. It is estimated that about half the industrial alcohol produced is denatured for utilization as industrial solvents, cosmetics and perfume, etc. One estimate has placed the cost of denaturing at about 14 cents per proof gallon (6). If this is so then, the estimated cost of production for undenatured alcohol would be about 28 cents per gallon in 1966 and for denatured alcohol about 47 cents per gallon. It is worthwhile to remember that costs of production vary among firms depending on the scale of operation. Larger capacity plants can be expected to have increased economies of scale and lower costs of production per unit of output.

Canadian Food and Drug Regulations stipulate that vodka may be produced from either grains or potato distillate but in practice Canadian vodka is produced only from grains. In 1966, 703,900 proof gallons of Canadian vodka were sold for a total value at the manufacturing level of about \$5 million. The average revenue was about \$7.14 per gallon and the proportion of the total industry revenue derived from the sale of vodka was about 2 per cent. If a similar proportion of the total variable cost is attributable to vodka, then the variable costs of vodka amount to \$2.4 million, for an average cost of \$3.43 per gallon of vodka shipped, excluding fixed costs. However, if vodka can be produced from potatoes in a potato producing area with variable costs in the region of \$3 per gallon then it should be competitive with vodka produced from grains, provided that consumer acceptance of the product can be realized.

Summary of Comparative Costs Of Production

The data summarized in Table 2 are extracted from a number of sources and all United States data have been converted to standard Canadian measures for ease of comparison. These cost figures most closely represent the cost of producing undenatured industrial ethyl alcohol or "raw" ethyl alcohol. Additional costs are involved in denaturing for non-potable uses, and in further processing into potable beverage spirits.

The reader is cautioned that "the cost of producing alcohol depends upon the location of the manufacturing plant; the design, type and degree of modernization of equipment; the kind of raw material used and the price paid for the raw material; the relative labor costs; the rate of production; and the total investment. It should be emphasized that there is no fixed "alcohol cost", for it will vary between plants

and even from day to day in the same plant" (7).

In the United States the least cost sources of raw ethyl alcohol are sulphite liquor, wood by-products and ethylene. Since the cost figures for the two former processes are based on 1950 experience and the cost figures for the latter based on 1965 experience it can be concluded that inflation will have had the impact of making the ethylene process the least cost process in current dollar terms, and this fact largely accounts for the predominance of synthetic alcohol production in the United States today.

The cost data related to the Canadian distilling industry are derived from the cost information discussed in the previous section. The data on potatoes were derived from a study done in 1965 by a Danish firm for a plant in Prince Edward Island, which was never constructed. The cost of production data at that time indicated that the production of industrial alcohol from potatoes would not be competitive unless the potatoes were assigned a value approaching zero. The value of potatoes used in the 1965 study was \$1.10 per 100 pounds (5).

Government sources indicate that manufacturers have received in recent years between 30 and 60 cents per proof gallon for undenatured ethyl alcohol and between 75 and 95 cents per proof gallon for denatured industrial ethyl alcohol, depending on whether the alcohol is sold to an affiliated company. When the proposed synthetic plant in Quebec becomes operational it is expected that an increased supply of industrial ethyl alcohol together with lower prices will place considerable pressure on less efficient forms of production. Even a plant utilizing sulphite waste liquor as a raw material, at no cost, will likely have a difficult time competing with the synthetic process.

CONCLUSIONS

The production of industrial ethyl alcohol, either denatured or undenatured, from potatoes is not an economically practical production alternative in Canada at the present time, unless the cost of potatoes as a raw material is at or near zero. Sulphite waste liquor is currently a much cheaper raw material to utilize than potatoes and when the synthetic process becomes operational, ethylene will likely become an even cheaper source of industrial ethyl alcohol.

There may be more scope for the production of beverage spirits, in particular vodka, from potatoes provided several problems can be overcome. First, the cost of the dehydrated potatoes must be competitive with grains; second, the technical difficulties associated with the handling and processing of potatoes need to be overcome; third, a market large

enough to warrant an economical scale of operation needs to be developed. In addition, the Canadian market is small and consumers would probably be reluctant to consume vodka of potato origin. There may be some potential for exporting vodka to European countries, but this possibility would require further investigation.

An efficient, well managed and highly integrated operation, located in a potato growing area, utilizing surplus potatoes at very low cost, might be able to compete in the beverage spirit phase of the distilling industry, if the aforementioned problems could be solved. However, it can be fairly stated that the barriers to profitable production would be substantial given the existence of flexible competition, diversified in both raw material supply and product lines. In the near future, the growing demand for processed potato products for human food would suggest that there is more scope for increasing the value of cull and surplus potatoes through processing for human food than through distillation for ethyl alcohol.

NOTES AND REFERENCES

- (1) A. Standen, et al, *Encyclopedia of Chemical Technology*, Vol. 8, 2nd ed., Interscience Publishers, New York, 1963, pp. 422-470.
- (2) M. S. Talburt and O. Smith, *Potato Processing*, The Avi Publishing Co. Inc., Wesport, Connecticut, 1959, pp. 436-38.
- (3) *Annual Census of Distilleries*, Cat. No. 32-206, Dominion Bureau of Statistics, Ottawa, 1968.
- (4) The definition of a Canadian proof gallon is as follows: One imperial gallon of spirits, containing 57.1 per cent alcohol and 42.9 per cent water by volume, at a temperature of 51 degrees Fahrenheit. Proof strength can be determined by a Sikes's hydrometer.
- (5) *Outline of A Plant For Processing Alcohol From Potatoes On Prince Edward Island*, 1965. This outline was obtained from the Department of Industry, Ottawa.
- (6) The author is grateful for valuable comments and suggestions made by W. R. Parkinson, Food Products Branch, and T. E. Barff, Chemicals Branch, of the Department of Industry; T. P. Stirling, Food, Beverages and Textiles Section, Dominion Bureau of Statistics; and E. N. Smith, Director, Excise Duty Division, Department of National Revenue. In addition, officers of the National Research Council, the Food and Drug Directorate of the Department of National Health and Welfare, and the Research Branch of the Canada Department of Agriculture, provided useful assistance.

POLICY AND PROGRAM DEVELOPMENTS

Sugar Beet Deficiency Payment—The deficiency payment on the 1967 sugar beet crop will total \$5.41 per standard ton of beets. An interim payment was made to producers in Ontario, Manitoba and Alberta early in 1968. The 1967 sugar beet crop was supported at \$15.50 a standard ton. (December 19, 1968)

Hog Quality Premium—With the introduction of the new hog carcass valuation system on December 30, 1968, a change in the quality premiums paid by the federal government came into effect. The new premium rate will be \$3 per hog carcass with an index of 103 or higher. (December 19, 1968)

Grain Drying Assistance—The application of the Prairie Grain Advance Payments Act is to be extended to provide interest-free emergency cash advances to western farmers to enable them to have their damp grain dried commercially on the farm.

The new interest-free loans are to be advanced against the security of undelivered grain. Loans will be made up to a maximum of \$600 per farmer at a rate of 10 cents per eligible bushel. The amount of the advance will be recouped from the producer when the grain is delivered.

The program will apply to grain dried on the farm from September 1, 1968 to June 30, 1969. (December 24, 1968)

PUBLICATIONS

ECONOMICS BRANCH PUBLICATIONS

Co-operation in Canada, 1966, Sullivan, J. M., Economics Branch, Canada Department of Agriculture, Ottawa, September, 1968. Publication No. 68/13. pp. 27.

This is the 35th annual summary of the business activities of co-operatives in Canada. Five types of co-operatives are reported on: marketing and purchasing, production, fishermen's, service and wholesale.

Marketing Boards in Canada, 1966, Fortier, R. L., Economics Branch, Canada Department of Agriculture, Ottawa, November, 1968. Publication No. 68/11. pp. 10.

This is the tenth annual summary of the activities of producer marketing boards or industry marketing commissions established under federal and provincial legislation in Canada.

UNITED NATIONS PUBLICATIONS

Available from the Queen's Printer, Ottawa

Learning Better Nutrition, Ritchie, Jean A. S., Food and Agriculture Organization of the United Nations, Rome, 1967, pp. xii + 264.

The need for education in food and nutrition, and methods of teaching are discussed in this book. Information is given about cultural and psychological influences on food patterns. The reasons for changes in food patterns and the roles that social organizations play in these changes, are explained.

Quality of Statistical Data, Zarkovich, S. S., Chief, Methodology Branch, Statistics Division, Food and Agriculture Organization of the United Nations, Rome, 1966, pp. xi + 395.

This book contains a detailed explanation of the results of errors made in collecting and in analyzing statistical data. Examples are given to illustrate the significance of problems arising from such errors. Some techniques for quality checking are presented also.

OTHER PUBLICATIONS

Not available from the Economics Branch

1967 Alberta Hog Enterprise Analysis, Hackett, B. A., and A. Reddon, Economics Division and Animal Industry Division, Alberta Department of Agriculture, Edmonton, October, 1968. Publication No. 816/440 — 4. pp. 36.

The costs, returns, and production practices of 44 Alberta hog enterprises in 1967 are described and analysed in this publication. Included is a chapter on improving production levels through breeding programs and feeding practices, as well as a section on management tools to use in decision making.

1967 Alberta Cow-Calf Enterprise Analysis, Hackett, B. A., Economics Division and Animal Industry Division, Alberta Department of Agriculture, Edmonton, November, 1968. Publication No. 816/420 — 7. pp. 43.

This management analysis report shows the 1967 returns, costs and physical production efficiency of

92 cow-calf enterprises in Alberta. Methods for improvement in production levels and management practices are discussed and examples are given.

Canadian Journal of Agricultural Economics, Vol. 16, No. 3, October 1968. Published three times a year by the Canadian Agricultural Economics Society. Copies available from the Society at Box 632, Postal Station B, Ottawa 4, Ontario, Canada. Single copies \$3.50. Annual subscription \$10.00.

Contents of the October 1968 issue include the following articles by members of the Society:

Effets des Facteurs de Production et Effets Régionaux sur le Revenu Agricole.

Philosophical Dimensions of Rural Poverty in Canada.

ARDA and Poverty—Lessons in Developmental Planning.

Rural Anti-Poverty Policy for the Future.

Canada's Contribution to Agricultural Foreign Aid. Aiding Agricultural Development—Some Lessons.

Canadian Industry and Food Production in Developing Countries—An Approach.

Cross-Cultural Incompatibilities Complicating Economic Development.

The Role of the Agricultural Economist in Foreign Agricultural Assignments.

The 1971 Census of Agriculture.

Economics of Environmental Control for Livestock.

Economic Integration and Model Building.

Intracity Retail Food Price Behavior and the Impact of Price Enquiries.

CANADIAN FARM ECONOMICS, VOLUME 3 INDEX

TECHNICAL ARTICLES

	Page
No. 1—April 1968 Issue	
Possibilities for Farm Development in Southeastern Renfrew County, Ontario—J. H. Lovering.....	8
The Probable Effects of the Application for Railway Branch Line Abandonment on the Grain Elevator Industry—D. Zasada.....	20
Egg Wholesaling in Canada—J. D. Kidd.....	24
Policy and Administration of Public Lands in British Columbia with Particular Reference to Agriculture—R. A. Stutt.....	29
No. 2—June 1968 Issue	
The Grain Corn Enterprise in Eastern Ontario, 1967—V. A. Heighton.....	4
Manufacturing Milk and Cream Production in Canada—W. J. White and V. A. Heighton.....	9
Other Sources of Income on Cream and Manufacturing Milk Producing Farms in Canada—W. Y. Yang.....	15
Structural Changes in the Cattle Enterprise of the Prairie Provinces—W. J. Lockhart.....	17
No. 3—August 1968 Issue	
Cycles in Production and Prices of Hogs in Canada and United States, 1953 to 1967—A. M. Boswell.....	7
Changes in Production and Gross Returns of Twenty Sheep Enterprises in Southern Ontario, 1964 to 1967—W. Y. Yang.....	11
Economics of Grain-Fallow Rotations and Fertilizer Use in the Prairie Provinces—J. G. MacKenzie.....	15
Policy and Administration of Public Lands in Saskatchewan with Particular Reference to Agriculture—T. F. Joyce.....	28
No. 4—October 1968 Issue	
Trends in Production and Utilization of Milk Solids-Not-Fat and Butterfat—H. J. Western and V. McCormick.....	1
An Analysis of World Wheat Exports by Types of Wheat—G. A. Hiscocks.....	6
Farm Credit Reviewed—R. S. Rust.....	13
National Farm Products Marketing Legislation and Organization—J. D. F. Kidd and G. A. Hiscocks.....	18
Starting Position and Pattern of Development of Starting Farming in the Rosetown-Elrose Area of Saskatchewan—R. G. Wiens.....	22
No. 5—December 1968 Issue	
Changes in Farm Structure and Business Size in the Red Deer Area of Alberta, 1962-67—J. H. Lovering, W. L. Oddie and L. M. L. Rokosh.....	1
Beef Cattle Production on Farms in Central British Columbia, 1966—M. M. Sorboe.....	8
Death of Farm Animals in Canada—W. Y. Yang.....	16
Some Observations on the Long Term Prospects of the Canadian Peach Industry—J. R. Burns.....	20
Pear Production in Canada—Raziuddin M. Siddiqui.....	29
Policy and Administration of Public Lands in Manitoba with Particular Reference to Agriculture—T. F. Joyce.....	35
No. 6—February 1969 Issue	
Agricultural Demand and Supply Projections for 1980—Zenon Yankowsky.....	11
The Anti-Dumping Act: Implications for Canadian Agriculture—M. N. Gifford.....	18
The Economics of Ethyl Alcohol Production with Particular Reference to Potatoes as a Raw Material—G. G. Pearson.....	20

COMMODITY REVIEWS

	Issue Number	Page
Grains, Feeds & Oilseeds		
Oilseed Situation and Outlook..... J. S. Carmichael.....	2	1
Grain Corn..... G. G. Pearson.....	3	1
Factors Affecting Canada's Competitive Position in World Trade in Oilseeds..... J. S. Carmichael.....	6	8
Livestock		
Continuous Expansion in Cattle Feeding..... A. M. Boswell.....	1	1
Recent Highlights of the Canadian Beef Cattle Industry..... A. M. Boswell.....	6	1

	Issue Number	Page
Dairy Products		
Canadian Dairy Commission Establishes Minimum Dairy Subsidy Quotas	V. McCormick	1 3
Dairy Products	V. McCormick	3
The Skim Milk Powder Situation	V. McCormick	6 3
Poultry and Eggs		
Foreign Trade in Poults and Turkey Hatching Eggs	J. D. F. Kidd	1
Eggs	J. D. F. Kidd	3 5
Fruits and Vegetables		
Tomatoes—Carlot Unloads—Toronto	J. R. Burns	1
Potatoes	J. R. Burns and E. S. Eaton	3
Potatoes	J. R. Burns	6
Sugar	E. S. Eaton	6 4

Outline 1969—Papers prepared for the 29th annual Federal-Provincial Agricultural Outlook Conference, held in Ottawa, November 25 and 26, 1968 were published in CANADIAN FARM ECONOMICS, VOLUME 3, SUPPLEMENT, DECEMBER 1968.

POLICY AND PROGRAM DEVELOPMENTS

	Issue Number	Page
Agriculture General		
Department of Agriculture Retirement	2	22
Agricultural Stabilization Board Appointment	2	22
Department of Agriculture Appointment	4	28
Farm Credit Corporation Appointment	4	28
Crop Legislation		
Crop Insurance (other crops eligible)	1	32
Grain Drying Assistance	6	25
Dairy Products		
Canadian Dairy Commission 1968-69 Quota Policy	3	32
Export and Import Trade		
Duty on United States Corn Imports	5	40
Farm Assistance		
Long Term Loans for Fur Farmers	3	32
Farm Credit Act Amendments	5	40
Farm Improvement Loans Act Amendments	5	40
Marketing Orders		
Ontario Tender Fruit Growers' Marketing-for-Processing	1	32
Ontario Grape Growers' Marketing-for-Processing	1	32
Saskatchewan Turkey Producers'	2	22
Ontario Bean Producers'	4	28
Alberta Potato Growers'	5	40
Manitoba Potato	5	40
Price Stabilization		
Dairy Subsidy Quotas	1	32
Egg Purchases by the Agricultural Products Board	2	22
Milk and Cream Stabilization Order	2	22
Federal Aid for Potato Growers	2	22
Cheese Support Price	2	22
Support Price for Eggs	2	22
Potato Price Stabilization Order	3	32
Lamb and Wool Support Programs	3	32
Sugar Beet Support Program	3	32
Egg Price Support Program	5	40
Sugar Beet Deficiency Payment	6	25
Hog Quality Premium	6	25

STATISTICAL APPENDIX

AVERAGE PRICES OF SELECTED CANADIAN FARM COMMODITIES, VARIOUS MARKETS AND GRADES, 1967-68

Commodity, grade and market	1967			1968			
	Average	Nov.	Dec.	Sept.	Oct.	Nov.	Dec.
dollars per cwt.							
CATTLE (weighted average prices at public stockyards)							
Good slaughter steers							
Toronto.....	27.65	28.50	28.09	28.84	27.51	27.29	27.00
Winnipeg.....	26.60	28.63	27.88	28.83	28.36	27.76	26.87
Calgary.....	26.05	27.23	26.89	27.04	26.17	26.30	25.62
Good feeder steers							
Toronto.....	28.70	28.50	28.50	28.25	27.67	27.68	27.71
Winnipeg.....	26.55	25.90	25.98	26.79	26.81	27.17	27.30
Calgary.....	26.40	26.38	26.00	27.12	26.35	26.56	26.03
Good and choice veal calves							
Toronto.....	36.15	35.13	37.62	33.00	33.40	34.79	36.99
Winnipeg.....	38.85	35.20	39.22	35.96	35.85	35.14	38.02
Edmonton.....	30.40	24.00	26.90	27.21	25.90	26.16	28.13
HOGS (weighted average prices at public stockyards Grade A dressed)							
Toronto.....	30.70	27.73	28.74	34.28	33.05	33.06	34.69
Winnipeg.....	28.55	26.35	26.86	33.39	31.92	32.14	32.63
Calgary.....	27.05	25.47	25.55	31.21	30.22	29.72	31.18
LAMBS (weighted average prices at public stockyards, Good lambs)							
Toronto.....	26.65	24.84	25.36	24.77	26.80	26.28	28.18
Winnipeg.....	21.40	18.54	19.95	22.23	24.56	24.21	24.77
Calgary.....	20.40	17.75	18.66	20.61	20.22	22.27	23.94
FLUID MILK (f.o.b. factory)							
Halifax.....	6.24	6.45	6.45	6.70	6.70	6.70	6.70
Montreal.....	5.96	6.00	6.00	6.00	6.00	6.50	6.50
Toronto.....	5.98	6.10	6.10	6.65	6.65	6.65	6.65
Winnipeg.....	5.84	5.97	5.97	5.97	5.97	5.97	5.97
Vancouver.....	6.93	7.13	7.16	6.92	6.90	6.92	6.94
MANUFACTURING MILK (average farm value) ^{a,4}							
Nova Scotia.....	3.22	3.46	3.33	3.57	3.62	—	—
New Brunswick.....	3.12	3.24	3.28	3.17	3.19	—	—
Quebec.....	3.32	3.38	3.38	3.39	3.45	—	—
Ontario.....	3.28	3.46	3.41	3.29	3.35	—	—
British Columbia.....	3.27	3.21	3.22	3.17	3.21	—	—
BUTTERFAT (for butter, average farm value) ^{a,5}							
cents per lb.							
Prince Edward Island.....	67.7	68.0	68.0	68.0	70.0	—	—
Quebec.....	64.8	65.5	65.5	65.5	65.5	—	—
Ontario.....	61.3	61.7	61.8	61.7	62.5	—	—
Saskatchewan.....	62.5	62.4	62.6	62.3	64.2	—	—
British Columbia.....	—	—	—	—	—	—	—
EGGS (average paying prices at registered grading stations, Grade A Large)							
cents per doz.							
Halifax.....	36.3	40.0	41.5	48.4	42.8	42.0	45.6
St. Anselme.....	35.5	36.1	36.2	50.0	47.0	46.0	50.0
London.....	33.4	32.7	33.5	47.0	45.5	43.6	49.0
Winnipeg.....	26.9	27.2	28.1	38.7	36.6	36.5	40.4
Vancouver.....	30.2	29.0	30.0	43.3	46.2	46.5	46.5
BROILERS (average prices paid to growers No. 1 grade chicken under 5 lbs.)							
cents per lb. live							
Toronto.....	19.6	19.9	20.5	21.5	21.5	20.8	20.0
Edmonton.....	21.0	21.5	21.5	22.5	22.5	22.5	22.5
TURKEYS (average prices paid to growers, No. 1 grade, 12-20 lbs.)							
London.....	23.7	24.8	25.2	25.5	25.5	25.6	25.3
Edmonton.....	25.4	25.5	25.5	26.5	26.8	27.5	27.5

AVERAGE PRICES OF SELECTED CANADIAN FARM COMMODITIES, VARIOUS MARKETS AND GRADES, 1967-68
(Concluded)

Commodity, grade and market	1967-68	1967		1968			
	Crop Year Average	Nov.	Dec.	Sept.	Oct.	Nov.	Dec.
POTATOES (Can. No. 1 Table, average prices to growers)							
dollars per cwt.							
Prince Edward Island.....	1.51	1.37	1.10	1.37	1.12	1.15	1.13
New Brunswick.....	1.22	1.28	1.12	1.25	1.13	1.12	1.03
Southwestern Ontario.....	1.92	2.03	2.05	2.27	2.03	1.77	1.73
EASTERN GRAINS							
cents & eights per bu.							
Oats (Ont. No. 2 White, f.o.b. shipping points)...	85	85	85	77/4	70	70	70
Barley (Ont. good malting, f.o.b. shipping points)	141/2	145	145	120	118/2	115	115
Corn (Ont. No. 2 Yellow, f.o.b. Chatham, 15% moisture, in carlots).....	130/7	124/4	126	130/2	109	114/4	122/2
Soybeans (Ont. No. 2, f.o.b. Chatham).....	278	275	271/5	262/4	248/7	255	258/2
WESTERN GRAINS (basis in store Fort William/Port Arthur, less freight and elevator handling charges)							
Red Spring Wheat (No. 2 Nor.)							
Winnipeg.....	179/5	176/2	177/3	183/2	179/6	178/3	179
Regina and Edmonton.....	176/2	172/6	173/7	179/6	176/2	174/7	175/4
Durum Wheat (No. 1 C.W.A.D.)							
Winnipeg.....	201/2	209/2	210/3	193/4	198	201	201
Regina and Edmonton.....	197/6	205/6	206/7	190	194/4	197/4	197/4
Feed Wheat							
Winnipeg.....	164/5	161/2	162/3	166/5	160/3	157	156/3
Regina and Edmonton.....	161/2	157/6	158/7	163/1	156/7	153/4	152/7
Oats (No. 1 feed)							
Winnipeg.....	82/4	82/6	82/2	76/7	76/1	73/1	73/1
Regina.....	80/4	80/6	80/2	74/7	74/1	71/1	71/1
Edmonton.....	78/4	78/6	78/2	72/7	72/1	69/1	69/1
Barley (No. 1 feed)							
Winnipeg.....	110/4	111/5	111/3	97/4	96/4	95/3	95/4
Regina.....	107/5	108/6	108/3	94/4	93/4	92/4	92/5
Edmonton.....	104/5	105/7	105/5	91/6	90/6	89/5	89/6
Rye (No. 2 C.W.)							
Winnipeg.....	120/3	118	117/6	112	112/4	111/3	109/7
Regina.....	116/1	115/2	114/5	108/5	109/1	108	106/4
Edmonton.....	113/6	112	111/3	105/3	105/7	104/6	103/2
Flaxseed (No. 1 C.W.)							
Winnipeg.....	336/6	335/4	336/4	332	323/1	313/3	306/1
Regina.....	334/3	332/2	333/2	328/6	319/7	310/1	302/7
Edmonton.....	330	328/6	329/6	325/2	316/3	306/5	299/3
Rapeseed (No. 1 C.W. basis in store Vancouver)	226/7	232/2	236/6	215/2	208/3	215/6	226/1

* Since the average farm values for manufacturing milk and butterfat published by the Dominion Bureau of Statistics (D.B.S.) do not include the federal subsidies, it is necessary to add, during the 12 months' period ended March 31, 1968, the federal payment of \$1.21 per 100 pounds of milk testing 3.5% butterfat, of which 11 cents were retained for export aid. The net payment was made directly to producers at the equivalent rate of 31.42 cents per pound of butterfat. Similarly for 1968-69, \$1.31 (less 15 cents) per 100 pounds should be added to manufacturing milk and 37.42 cents per pound (less 1 cent) to butterfat. The 1967 yearly average figure excludes the federal payment of 85 cents per 100 pounds (less 7.3 cents for export assistance) for the January-March period.

† The 1967 yearly average farm values for manufacturing milk and butterfat to producers in the Province of Quebec exclude a subsidy payment of 10 cents a pound butterfat, made by the Quebec Government, for the January-March period. The policy was terminated on March 31, 1967.

‡ The 1967 yearly average farm values to producers in the Province of Ontario exclude a payment, made by the Ontario Government, for the January-March period of 25 cents a 100 pounds of manufacturing milk and secondary and excess fluid milk delivered to plants, basis 3.5% butterfat. For all cream grading Special and No. 1 the payment was 10 cents a pound butterfat.

§ Beginning January 1, 1968, a new D.B.S. series for the average farm value of manufacturing milk includes all milk used for manufacturing purposes. Milk used for the manufacture of butter was previously excluded. Comparable figures are shown for 1967.

¶ Beginning January 1, 1968, a new D.B.S. series shows the price of butterfat in cream for manufacturing into butter (farm-separated cream) and is not comparable with the previously published series for butterfat, which included the butterfat in milk used for manufacturing butter. Comparable figures are shown for 1967.

VOLUME 3 SUPPLEMENT

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CANADIAN FARM ECONOMICS

OUTLOOK 1969

- General Economic Situation and Outlook..... 1
- Grains, Feeds and Oilseeds..... 17
- Livestock, Meat and Wool..... 32
- Dairy Products..... 45
- Poultry Meat and Eggs..... 51
- Fruits, Vegetables, Honey and Maple Products..... 60
- Special Crops..... 80
- Cereal, Oilseed and Forage Crop Seeds..... 85
- Summaries of Papers..... 93
- Agricultural Stabilization Programs..... 105

HON. H. A. OLSON, MINISTER — S. B. WILLIAMS, DEPUTY MINISTER

This issue of CANADIAN FARM ECONOMICS contains the background papers presented to the 29th annual Federal-Provincial Agricultural Outlook Conference, held in Ottawa, November 25 and 26, 1968. These papers were prepared by committees representative of the Departments of Agriculture, Finance, Industry, Manpower and Immigration, Trade and Commerce, the Dominion Bureau of Statistics and the Bank of Canada. The reports as prepared for the Conference were based generally on information available at mid-September.

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CANADIAN FARM ECONOMICS

GENERAL ECONOMIC SITUATION AND OUTLOOK

INTERNATIONAL ECONOMIC SITUATION

World economic activity gained renewed momentum during the latter part of 1967 and continued on a moderately stronger course during the opening half of 1968. Expansion of economic activity was widespread affecting most of the industrially-advanced countries, notably the United States, Germany, Britain and France (prior to the general strike which disrupted the whole French economy in May and June). More recently, signs of a slackening in tempo have again appeared with indications that world growth will be at a somewhat slower pace in the coming year.

The most recent phase of faster growth began to lose momentum about mid-1968. An important contributing element has been the initiation or intensification by several governments of policies of restraint to deal with balance of payments difficulties. At different times, the public authorities in the United States, Britain and Japan have taken steps to restrain growth in their respective economies to prevent further deterioration in their external accounts.

The United States, by mid-1968 had finally enacted a 10 per cent income tax surcharge together with proposed extensive cuts in non-defence current budgetary expenditures. This is expected to add impetus to forces already in evidence that appeared to be working toward a situation of slower growth. However this essentially would be an adjustment from an unsustainably rapid pace of growth of activity since the final quarter of 1967.

The British economy has achieved a moderate increase in industrial output during the period since the November 1967 devaluation. Nevertheless, the adverse balance of payments position in the first half of 1968 has continued, mainly because of the persistence of a strong import trend in spite of the higher foreign exchange costs of imports due to devaluation. Merchandise exports showed considerable improvement in the first half of 1968. The official policy for some time to come, however, will likely continue to be directed toward containing domestic demand and reinforcing the shift of resources into export markets.

Growth trends strengthened in EEC countries fol-

lowing mid-1967, but the extent of improvement in the intervening period has varied widely from one country to another. In Germany a sharp economic upturn has taken place after a temporary but severe check in output growth last year. A moderate acceleration in French growth was interrupted by widespread labor disputes and work stoppages during the second quarter of 1968. A crisis atmosphere, in turn, has led to a sharp decline in French foreign exchange reserves, and measures are being taken to protect the balance of payments position. Substantial wage increases granted workers to restore industrial harmony may provide a considerable boost to consumer spending in the coming months and contribute toward a renewal of rapid growth. To restrain price and cost pressures due to renewed economic expansion, France is relying on increased international competition (final abolition of tariffs within E.E.C. and Kennedy Round reductions) and a system of semi-voluntary guidelines for industrial prices. Italy, though also affected by strikes but to a lesser extent than France, has again made significant economic gains. Business strength has reflected buoyant trends in domestic demand and continuing export growth.

Other smaller European countries have shown mixed trends in 1968, but are expected on balance to achieve moderate growth rates in the coming year.

After two years of rapid expansion which resulted in a marked deterioration of its balance of payments position, Japan imposed restrictive measures in the second half of 1967. This has led to a pronounced slowing in the rate of economic growth, but has been accompanied by a substantial improvement in Japan's export trade surplus. Despite the dampening effect of official restraints, the Japanese economy appears to contain great underlying strength which may be expected to spark a renewal of vigorous expansion when fiscal and monetary measures are relaxed.

Economic trends in the more advanced primary exporting countries, for the most part, have improved during the past year. Major contributions to this improvement were made by substantial increases in agricultural production and the strengthening of import demand for raw materials in major industrial

countries. With commodity prices generally sustained and a higher volume of raw material purchases, the foreign exchange reserves of the less highly developed countries have risen moderately again in 1968.

CANADIAN ECONOMIC SITUATION AND OUTLOOK

The rate of economic growth in Canada in 1968 is expected to be greater than in the preceding year, though well below the rapid pace of expansion between 1961 and 1966 when a good deal of slack existed in available resources. With moderately faster growth in real output and a somewhat slower rise in prices, the increase in GNP in 1968 may show little change from the 7 per cent advance of the preceding year.

The fast rise in prices and costs evident since 1966 continued to be a matter for concern during the first half of 1968. The federal government adopted certain measures designed to ease inflationary pressures, including a slowdown in the rate of expansion of government programs and the enactment of a 3 per cent surcharge on income tax. Early in 1968, the external value of the Canadian dollar came under pressure in the wake of international uncertainty following sterling devaluation and a broadening of the United States balance of payments program. Temporary measures were adopted to restore confidence in the Canadian dollar which strengthened markedly during the year.

The exceptional buoyancy of trends in the United States through mid-1968 gave a major boost to Canadian economic activity. Exports expanded sharply with higher sales to the American market accounting for a very large part of the total gain. Exports of motor vehicles were responsible for a considerable portion of the increase. However, export commodities such as non-ferrous metals, iron ore, petroleum, asbestos, lumber, wood pulp and fertilizers also were well ahead of last year. A drop in wheat and flour exports in the first half of 1968 reflected increased competition in world markets due to the notable improvement over the year in world cereal supplies.

Rising consumer spending continued to provide economic stimulus during 1968 with buoyant consumer trends reflecting further significant income advances. Rising government outlays continued to play a sustaining role, though public authorities have taken action to check the earlier rapid increase in public spending. Construction of new housing gained quite strongly after slowing in 1967. Business investment, on the other hand, showed little change from a year earlier.

Even after a moderate pick up in industrial growth

the Canadian economy apparently operated in 1968 with some unused capacity in plant and manpower. Labor force growth exceeded the increase in new job opportunities, with summer unemployment, partly due to a temporary upsurge in student job seekers, running slightly over 5 per cent on a seasonally adjusted basis.

Economic growth in 1969 is expected to continue at a pace not markedly different than that experienced in 1968. A principal factor in the general sustaining of the present rate of advance is the expectation that growth in consumer spending will continue to be supported by favorable trends in personal disposable income. The housing sector is expected to show a further sharp increase following somewhat easier monetary conditions with interest rates backing off from their present historically high levels. Non-farm inventory accumulation which showed very little increase between mid-1967 and mid-1968 may be expected to contribute more substantially to the overall advance in economic activity. Moreover, while renewed vigorous advance in business capital investment similar to that of 1964-66 is not likely for some time yet on the basis of present trends, it is possible to anticipate an advance in this sector moderately higher than the insignificant rate of advance that occurred during 1967-1968.

On the other hand, it must be considered that Canada's economic activity will be proceeding against a temporary but sharp adjustment period in the United States economy—by far our largest export market. Accordingly, Canada's merchandise exports in 1969 are expected to increase more moderately than in either 1967 or 1968. Some moderate deterioration in Canada's merchandise trade surplus would not be unexpected since this reached a post-war high peak in 1968. Some further easing of cost and price pressures in the face of a continuing ease in the availability of resources is also indicated.

AGRICULTURAL SITUATION AND OUTLOOK

World Agricultural Review and Outlook

Production, Stocks and Trade—World agricultural and food production, excluding Mainland China, increased by about three per cent in 1967 over 1966. In the developing countries, food production is estimated to have increased by six per cent, the largest gain for many years and, on per capita basis, made up much, although not all, of the ground lost in 1965 and 1966. There was an increase of about six per cent in food production in Western Europe and about three per cent in North America. Production in Eastern Europe and the Soviet Union fell slightly below the record of 1966. In Oceania, food production declined by 11 per cent in 1967.

The main feature of the increase in world agricultural production as well as in food production in 1967, was a rise of three per cent in grain production. Wheat output, estimated at 10.4 billion bushels, fell by five per cent in 1967, but it still was substantially higher than in any year before the record 1966 harvest. There were record crops of wheat in the United States, Western Europe, Eastern Europe, India, and Turkey; average crops in the Soviet Union, Canada, and Argentina; and a poor crop in Australia.

World production of coarse grains in 1967 was slightly above the previous year's record. Most of the increase occurred in the United States and Western Europe. In the Soviet Union and Eastern Europe, production did not reach the exceptionally high levels achieved in 1966. World production of main livestock products continued to increase in 1967. For meat, the increase was greatest for pork and poultry meat, and least for mutton and lamb. Total world meat production increased by about four per cent and there were small increases in the production of milk, wool, and eggs.

World agricultural production in 1968 is expected to increase over the 1967 output. World wheat production is estimated to reach the high levels of the past two years. The 1968 production prospects for the five largest exporters—Australia, Argentina, Canada, France and the United States—point to an output above the record 3.25 billion bushels produced in 1966. A crop of about equal to the 1967 is expected in Western Europe but, in Eastern Europe, wheat production will be well below the bumper crop of 1967. The Soviet Union is expected to harvest a slightly larger crop in 1968 than in 1967, but the total output of wheat in the Soviet Bloc countries will probably be smaller this year than a year ago. World wheat trade in 1968-69 may be little different from the estimated 1967-68 level of 1.95 billion bushels, and supplies will continue to be ample in relation to demand. Production of coarse grains will probably be lower in 1968, but production of fats and oils will continue to rise this year. World supplies of milk and dairy products are expected to be larger in 1968 than in 1967. The butter market situation is expected to remain precarious in 1968-69, and large supplies of skim milk powder and possibly cheese will also continue to exert pressure on international prices. World meat supply is expected to continue its increasing trend in response to continued growth in demand.

The over-all level of world stocks of major agricultural products did not change much during 1967-68. However, wheat stocks in the five major exporting countries increased by about six million tons to about 38 million tons (1.4 billion bushels) by the end of the 1967-68 crop year; it still was about ten million tons

less than the average carry-over during the first half of the 1960's. Butter stocks in Western Europe, North America and Oceania increased by 30 per cent (to approximately 450,000 tons) and created surpluses of substantial proportions. Stocks of coffee, sugar, natural rubber, and tobacco continued to be large.

The volume of world trade in agricultural products declined by one per cent in 1967, and there was a two per cent decline in agricultural export earnings. North American earnings declined sharply (12 per cent) because grain exports were much lower. However, the earnings of Western Europe and Oceania were higher by eight and six per cent, respectively. Agricultural export earnings of the developing regions declined by about two per cent, for the second successive year. Imports of agricultural products into the developing countries in 1967 remained at the 1966 level, but there was a slight decline in grain imports. Several important international developments during 1967 affected and/or will continue to affect the level and direction of trade in agricultural commodities: the Middle East crisis, devaluation of the pound sterling, the U.K. foot-and-mouth disease epidemic, conclusion of the Kennedy Round of GATT negotiations and the new International Grains Arrangement.

Prices and Farm Income—The over-all level of international prices for agricultural products showed a downward trend in 1967. The index of world export prices for primary agricultural products was about four per cent lower than in 1966. Prices for food (in dollar terms) increased by about one per cent but there was a ten per cent decline in non-food prices. Unit values were higher for wheat, rice and sugar, but there were sharp drops in those of meat and virtually all vegetable oils, oilseeds and dairy products. In the first half of 1968, the over-all price level for agricultural products remained stable but stayed slightly below the level of the corresponding period of 1967.

Farm prices in 1967 fell in Austria, Belgium, Canada, West Germany, New Zealand and the United States. However, there were increases in farm prices in some European countries such as Britain, Finland, Hungary, Ireland, the Netherlands, Norway, Portugal, Sweden and Switzerland. The prices paid by farmers increased in 1967 in general and the increase in prices paid outweighed the change in prices received by farmers. Thus, it was only in five countries (India, Norway, South Korea, Ireland and South Africa) that the ratio (or purchasing power of farm prices) between prices received and paid by farmers improved during 1967.

Farm income in 1967 in the developed countries remained more or less unchanged from the year before. The total realized net farm income in the United States in 1967 declined by about 12 per cent from

1966. As in Canada, farm income improved in Britain, Ireland, Norway, Sweden, West Germany and France. Farm income in Denmark and Spain remained at the 1966 level but declined in Australia.

Policies and Development Plans—There have been no major changes in the United States' policies relating to food and agriculture since the enactment of the Food and Agriculture Act of 1965 (expires at the end of 1969) and the Food for Peace Act of 1966 (amended P.L. 480, the Agricultural Trade Development and Assistance Act of 1954). Legislation to extend the provisions of the Food and Agriculture Act of 1965 is before the Congress. Permanent legislative authority is sought by the Administration for the continuation of present programs for wheat, feed grains, cotton, wool, and of the Cropland Adjustment Program.

In 1968, the Food for Peace Act of 1965 (P.L. 480) was amended once more and extended for a further two years until December 31, 1970. Authorizations for U.S. food aid programs under the amended Act will remain at past levels (annual \$1.9 billion authority under Title I and \$600 million under Title II), but a number of new amendments have been added, with the primary aim of improving the U.S. balance of payments position.

The U.S. Government has modified its wheat program for 1969. The 1969 wheat allotment, at 51.6 million acres, is down 13 per cent from the 59.3 million acres in effect for the 1968 crop. Diversion payments will be offered to farmers for planting less than their acreage allotment and diverting their land to conservation uses. For farmers complying with the program, the loan rate for 1969 is to be maintained at \$1.25 a bushel for wheat, as in 1968, which remains as the minimum guaranteed return to the farmer. Domestic marketing certificates which will make up the difference between parity and the loan rate (as of July 1, 1969) will be issued on 43 per cent of the participating farms' projected production, compared with 40 per cent in 1968. The certificate value for the 1968 crop is \$1.38 a bushel. In 1967, the certificate value was \$1.36 a bushel, and the average return to 1967 program participants amounted to \$1.92 a bushel.

Temporary import quotas on evaporated and condensed milk and cream were placed on June 10, 1968. The quotas will remain in effect, pending action on an investigation and recommendation by the U.S. Tariff Commission regarding the need for permanent quotas. The commission is also investigating the need for quotas on a number of other dairy products not now under quota.

In Western Europe, there has been growing realization that price supports at the level required to safeguard commercial farms are not adequate instru-

ments for relieving rural poverty. Social subsidies tied to reforms of farm structure thus begin to command more practical attention. Structural improvements and related measures have been given increasing emphasis; assistance takes a wide variety of forms of which the most commonly used are grants and loans of various kinds to facilitate amalgamations or joint operation of small farms, and pensions or other payments to farmers who retire early. At the same time, it is recognized that for many years to come farms too small for achieving reasonable profitability and adequate rewards for labor and capital will prevail.

On July 1, 1968, the six member states of the European Economic Community reached one of the main objectives set by the Treaty of Rome in 1957. They completed the formation of a customs union with the coming into effect of a single external tariff and the complete removal of internal customs duties. In addition, in the field of agriculture, where tariffs were by no means the only means of protection, they brought under a Common Agricultural Policy—based on common prices, common import and export regimes and Community financial support—all the main Agricultural commodities entering into their trade.

The common market for rice came into force on September 1, 1967. Common markets for milk and dairy products and for cattle and calves were scheduled for April 1968 but agreement on their terms was not achieved until late May, and they came into force on July 1, 1968. Unified markets for sugar and tobacco, and for flowers and ornamental plants also became operative on July 1 this year, thus making the agricultural common market virtually complete.

In Britain, the new Agriculture (Miscellaneous Provisions) Act of 1968 provides authority for the bacon stabilizing arrangements, extends the powers of wages committees, modifies the Restrictive Trade Practices Act, provides safeguards for the welfare of farm animals, and increases the compensation payable to tenant farmers. In its 1968 Price Review, the Government awarded higher price guarantees for a wide range of products: hogs, milk, barley, oats, potatoes and sugar beets (increases ranging from 1.5 to 3 per cent) and cattle, sheep, lambs and wheat (increases between 4 and 5 per cent). In addition, the standard quantity to which price guarantees apply was abolished for wheat and increased for milk and barley, while the beef cow and hill cow subsidies were raised.

In Eastern Europe, expansion of farm production continues to be a main policy objective; it is to be achieved by general improvement of yields and efficiency rather than by an extension of cultivated areas. Thus, supply of more and better inputs has been re-

ceiving attention in that region. Fertilizer supplies have increased markedly, although there are still wide variations in the intensity of use. The substantial increase in wheat yields in Eastern Europe has been attributed to the work of the Council for Mutual Economic Aid (COMECON). In the Soviet Union, the targets for livestock products in the five-year plan for 1966-70 were adjusted upward in 1967. Fertilizer production capacity and output in the USSR, as set out in the current five-year plan, are considered insufficient, and it has been decided to increase production from about 44 million tons in 1968 to 88 million tons by 1972.

In Latin America, a few new development programs have come into effect. Brazil adopted a three-year public investment program, and an agricultural development plan law was passed in Peru. In the Far East, the Indian Planning Commission approved the draft of the new fourth plan due to start in 1969. A 5 per cent growth rate, which implied a rate of 4.5 per cent in agriculture and 7 to 8 per cent in industry, was accepted in principle by the National Development Council. Both East and West Pakistan have started new programs in order to achieve self-sufficiency in food by the end of the current plan (1970). In Indonesia, agricultural development efforts are concentrated on the intensification of rice production. In the Philippines, with the help of high-yielding varieties and increased utilization of other necessary inputs, it is hoped to achieve self-sufficiency in rice in 1969, or one year ahead of the plan.

Canadian Farm Production and Income

Farm Production—A preliminary forecast of farm production for Canada for 1968 indicates that the index will be approximately 5 per cent above the level of 159.6 (1949 = 100) established in 1967. This increase is mainly due to considerably larger grain crops which are forecast for 1968 and partly due to a small increase in the output of poultry and eggs. Production of livestock appears to be approximately the same as in 1967, while the output of potatoes is expected to drop.

Farm Cash Receipts—In 1968, farm cash receipts from the sale of farm products are expected to reach \$4.3 billion, slightly below the \$4.4 billion realized in 1967. Of the commodities contributing to this decline, wheat exhibited the greatest reduction in farm cash receipts during 1968. The value of marketings, which for the first half of 1968 was about \$30 million below that of the equivalent period of 1967, is expected to continue to be lower than in the previous year, resulting in a drop in receipts for the year of about \$75 million. This situation reflects the decline

in wheat exports in the first half of the year and relatively congested commercial storage facilities. A similar pattern of lower farm marketings has been experienced for barley. Partially offsetting these declines is the increased income from Canadian Wheat Board participation payments which rose by 15.3 per cent, from \$311.8 million in 1967 to \$359.6 million.

Flaxseed sales during the first half of 1968 were considerably below those for the same period of 1967. However, with the large increase in production that occurred this year, it is expected that sales during the latter part of the year should prove sufficient to push the value of 1968 sales to levels at least equal to those of 1967. The value of farm sales of rapeseed is expected to be below that of the previous year, mainly due to lower prices which, for the first six months of this year, averaged about 50 cents a bushel below those of the first half of 1967. Average prices of potatoes, which were higher during the first six months of this year compared with the earlier part of 1967, should maintain this over the previous increased receipts from this source. The anticipated high yield of a good quality tobacco crop should mean that receipts during 1968 will be at least equal to those of the previous year. It is expected that the lower apple crop will more than offset possible higher prices, resulting in the income from fruit being about the same or possibly lower than that obtained in 1967.

Of the commodities showing a gain, the increase in the receipts from the sale of cattle was the most important. From a total value of \$788.9 million in 1967, the value of sales is forecast to increase to \$840.3 million in 1968. This gain results from increased marketings during 1968. Hog marketings should be slightly higher in 1968 compared with the previous year. Although the quantity marketed during the first six months of this year was considerably higher than in 1967, this trend is not expected to continue, and marketings during the second half of 1968 will probably be a little lower than in the corresponding period of 1967. In contrast, prices during the latter part of 1968 will be higher than in the early months of the year. Cash receipts from the sale of calves during the January-June period of 1968 remained very close to those of the same period of 1967. It is expected that this trend will continue and that annual sales will be similar for both years. Value of receipts from dairy products should be a little higher this year compared with the level attained in 1967. Receipts from the sale of poultry may similarly be slightly higher this year. Although receipts during the first half of 1968 were lower than a year earlier, this situation is expected to be reversed during the latter part of 1968. In particular, turkey prices should be stronger as a result of expected higher prices in the U.S., reducing the vol-

ume of imports into Canada. A similar pattern should occur for eggs where receipts for the first half of 1968, which were slightly below those of 1967, should increase during the second part of the year, resulting in 1968 total receipts being somewhat above the previous year.

Farm Operating Expenses—Farm operating expenses and depreciation charges continued to move upwards in 1968 as prices of most goods and services used in farming showed increases. Taxes on farm land will follow the trend of previous years and continue to climb. It is anticipated that due to higher grain production in Western Canada share rent will push up gross rental charges. Although the number of hired farm workers was lower during the first half of 1968 compared with the corresponding period a year ago, the general increase in wages is expected to push the annual wage bill slightly above 1967. There are some indications that less credit may be extended to farmers this year. However, as interest charges are mainly affected by credit extended in previous years and as interest rates have moved upwards this year, the total effect is likely to be that charges will be somewhat higher than in 1967. Prices of petroleum products are up slightly and this, together with expanded consumption, will result in higher expenditures for these items. It is estimated that farmers used 5 per cent more chemical fertilizers in 1968. Prices are presently estimated as being above last year's levels, thus resulting in higher expenditures for this farm input. Indications for the first six months of 1968 show that a slightly lower quantity of manufactured livestock and poultry feed was purchased by farmers at lower prices. Continuation of this trend would result in feed expenditures declining in 1968. This would represent the only decline in an input item of major importance. In contrast, farmers' expenditures for pesticides will continue the rapid advance which has become evident in recent years. Altogether, farm operating expenses and depreciation charges in 1968 are expected to be about \$150 million higher than in 1967.

Net Income—Due to a possible decline in total cash receipts this year together with increases in operating expenses and depreciation charges, realized net income from farming operations for 1968 is expected to be below that of a year ago. In contrast, total net income for 1968 will be about \$1.7 billion, almost \$200 million greater than in 1967. This increase results from the expanded output of grain in the Prairie Provinces causing the value of inventories to be higher at the end of 1968 than was the case in 1967.

Farm Income Prospects for 1969—Total cash receipts from farming operations in 1969 will probably

be slightly higher than those estimated for 1968. Although much will depend on farmers' deliveries of wheat, it is presently expected that they will continue at about the 1968 level. Flaxseed sales will most likely be greater in 1969 while sales of rapeseed will probably decline. Cash returns from crop sales should therefore be at a similar level to that attained in 1968.

For 1969, higher returns are forecast for livestock and livestock products. Cattle marketings will probably be similar to those of 1968. However, increased prices should boost income from this source. In contrast, marketings of hogs are likely to be down in 1969 but, with higher prices, receipts should be the same or higher. Little change is expected in the volume of dairy products sold during the year. With prices reaching higher levels than in 1968, income from this source could show improvement. A possible stronger demand for poultry meat should result in somewhat higher income. Egg production, which will probably drop in the early part of next year, should expand later and, with higher prices, provide an income at least equal to that earned during 1968. It is expected that farm expenses will continue to increase in 1969 but possibly at a slower rate. Although it is unlikely that declines will be exhibited in the value of any of the major items purchased, costs for labor and feed, and interest charges on debt, should increase more slowly. As the slight increase in cash receipts is expected to be more than offset by a further increase in farm expenses, realized net income is therefore expected to be lower in 1969 than in 1968.

AGRICULTURAL INPUT SITUATION AND OUTLOOK

Farm Input Structure

In contrast to a general decline in the volume of agricultural inputs in Canada during the 1950's, there has been an upward trend in the 1960's. The average annual increase in total farm production inputs between 1963 and 1967 was 1.7 per cent. During the same period, capital inputs increased at an average annual rate of 5.2 per cent, real estate inputs at 0.6 per cent; labor declined at an average of 3.2 per cent annually.

In 1967, expansion in farm inputs exceeded the five-year average which was due mainly to the interruption of the steady down-trend in farm labor. Between 1966 and 1967, all farm inputs increased by a total of 2.9 per cent, which is composed of increases amounting to 4.1 per cent for capital, 2.8 per cent for labor, and 0.2 per cent for real estate.

Real estate inputs, including interest on investment, depreciation, building repairs, and property taxes, reached 117 in 1967 (1949 = 100), up from 116

in 1966 and 113 in 1965. The slower rate of advance in this input category arose mainly from smaller increases in farm land values in 1967 (Table 1).

The labor index in 1967 stood at 52 compared with 50 in 1966 and 55 in 1965. This increase indicates a tendency for surplus family labor in a slackening economy to immediately back up into agriculture, and conversely, the natural flow of labor from agriculture is facilitated by favorable conditions in the non-farm labor market and the economy in general. A resumption of the down-trend in farm labor inputs is envisaged for 1969 though the trend will probably flatten out.

The composite of all inputs other than real estate and labor, commonly referred to as capital inputs, reached an index level of 174 in 1967, up from 167 in 1966 and 157 in 1965. Generally, capital input categories increased less in 1967 than in 1966. The feed and seed index advanced 8 points in 1967 compared to 16 in 1966. The index for fertilizer and limestone has been rising fastest since 1949, reaching a level of 316 in 1967, up from 282 in 1966 and 244 in 1965. For machinery and equipment, the advance in the index in 1967 equaled that of 1966. The index

of all other capital inputs went up five points in 1967 to 177, an increase also equal to that in the preceding year.

The volume changes in the various agricultural inputs in 1967 were such that the input mix was not noticeably altered. In both 1966 and 1967, real estate inputs accounted for 23 per cent of all inputs, labor, 24 per cent, and capital inputs, 53 per cent. The shares for machinery and equipment remained unchanged at 22 per cent, for purchased feed and seeds at 17 per cent, for fertilizers and limestone at 4 per cent (Table 2).

Farm Labor

The results of monthly labor force surveys show that the average employment in Canadian agriculture was 558,000 workers in 1967, including both farm family and hired labor. This represents an increase of 2.8 per cent over the 1966 annual average and a break of the steady downward trend in the farm labor force over the past decade. Average employment for the period, January to July 1968, was slightly below the same period in 1967. While in

TABLE 1—INDEXES OF PRODUCTION INPUTS, CANADIAN AGRICULTURE (EXCLUDING NEWFOUNDLAND), BY SELECTED CATEGORIES, AND AVERAGE ANNUAL CHANGES, SELECTED PERIODS, CANADA, 1948 TO 1967

	Real Estate ^a	Labor ^b	Capital				Total Capital	Total Production Inputs
			Machinery and Equipment ^c	Purchased	Fertilizer and Limestone	Other ^e		
				Feed and Seed ^d				
1949 = 100								
1948-1952 ^f	99	93	105	98	100	105	103	97
1953-1957 ^f	103	76	123	106	110	119	117	94
1958-1962 ^f	110	64	122	135	142	148	132	95
1963.....	113	60	130	141	188	166	143	97
1964.....	112	58	134	155	226	172	151	98
1965.....	113	55	140	164	244	167	157	99
1966.....	116	50	145	180	282	172	167	100
1967.....	117	52	150	188	316	177	174	103
1963-1967 ^f	114	55	140	166	251	171	158	99
Average Annual Changes ^g								
				per cent				
1948-1967 ^f	+0.7	-3.4	+2.7	+ 6.8	+1.8	+2.5	+2.4	-0.1
1963-1967 ^f	+0.6	-3.2	+3.6	+13.6	+7.5	+2.8	+5.2	+1.7
1966-1967.....	+0.2	+2.8	+3.0	+11.8	+4.4	+3.1	+4.1	+2.9

^a Includes interest on investment, depreciation and repairs on building; property taxes and fencing (all for both owned and rented real estate).

^b Includes farm operators, unpaid family labor and hired farm labor.

^c Includes fuel and other purchased items associated with machinery operation plus interest on investment and depreciation.

^d Includes both farm and non-farm portions of feed, and seed purchased from the non-farm sector plus nursery stock.

^e Includes electric power, interest on investment in livestock and on livestock purchased (feeders) from the non-farm sector, artificial insemination fees, breeder association fees, veterinary services and supplies, custom work by non-farm operators, telephone, insurance, pesticides, containers, twine, irrigation charges and other miscellaneous purchased inputs.

^f Annual average.

^g Represents the weighted average of all annual changes for the respective periods.

Sources: Farm Finance Section, Agriculture Division and Prices Division, Dominion Bureau of Statistics.

TABLE 2—DISTRIBUTION OF PRODUCTION INPUTS, CANADIAN AGRICULTURE (EXCLUDING NEWFOUNDLAND), BY SELECTED CATEGORIES, SELECTED PERIODS, CANADA, 1948 TO 1967 (VALUED AT 1949 PRICES)^a

	Real Estate ^b	Labor ^c	Capital				Total	Total Production Inputs
			Machinery and Equipment ^d	Purchased Feed and Seed ^e	Fertilizer and Limestone	Other ^f		
per cent of total production inputs								
1948-1952*	20	46	17	9	1	7	34	100
1953-1957*	22	39	20	10	2	7	39	100
1958-1962*	23	33	20	13	2	9	44	100
1963.....	23	30	21	13	3	10	47	100
1964.....	23	29	21	14	3	10	48	100
1965.....	23	27	22	15	3	10	50	100
1966.....	23	24	22	17	4	10	53	100
1967.....	23	24	22	17	4	10	53	100
1963-1967.....	23	27	22	15	3	10	50	100

^a The per cent distribution in this table was arrived at by calculating the value of each input category for each year or period, at constant prices, aggregating all inputs for that period, and then relating individual input categories to the total. Detail information on methodology of computing productivity estimates can be found in I.F. Furniss, Trends in Agricultural Productivity, *Canadian Farm Economics*, Volume 2, Number 1, April 1967, pp. 15-21.

^b Includes interest on investment, depreciation and repairs on building; property taxes and fencing (all for both owned and rented real estate).

^c Includes farm operators, unpaid family labor and hired farm labor.

^d Includes fuel and other purchased items associated with machinery operation plus interest on investment and depreciation.

^e Includes both farm and non-farm portions of feed, and seed purchased from the non-farm sector plus nursery stock.

^f Includes electric power, interest on investment in livestock and on livestock purchased (feeders) from the non-farm sector, artificial insemination fees, breeder association fees, veterinary services and supplies, custom work by non-farm operators, telephone, insurance, pesticides, containers, twine, irrigation charges and other miscellaneous purchased inputs.

^g Annual average.

Source: Farm Finance Section, Agriculture Division and Prices Division, Dominion Bureau of Statistics.

TABLE 3—EMPLOYMENT IN AGRICULTURE, INCLUDING SELF-EMPLOYED, AVERAGES OF MONTHLY SURVEYS, CANADA, BY REGIONS, SELECTED PERIODS, 1958 TO 1968

Region	Annual Averages							January to July	
	1958-62	1963	1964	1965	1966	1967	1963-67	1967	1968
	thousands								
Atlantic.....	53	34	38	33	32	29	33	26	26
Quebec.....	144	124	114	116	106	114	115	108	117
Ontario.....	171	172	160	151	140	147	154	139	135
Prairies.....	294	300	296	271	240	243	270	235	226
British Columbia.....	26	18	22	22	25	25	22	26	28
Canada.....	688	648	630	593	543	558	594	534	532
Employment in agriculture as per cent of all industries.....	11.6	10.2	9.5	8.7	7.6	7.6	8.7	7.3	7.2
	per cent								

Source: *The Labour Force*, Catalogue No. 71-001, Dominion Bureau of Statistics.

TABLE 4—EMPLOYMENT IN AGRICULTURE, BY CLASS OF WORKER, CANADA, SELECTED PERIODS, 1958 TO 1968

Class of Worker	Annual Averages							January to July	
	1958-62	1963	1964	1965	1966	1967	1963-67	1967	1968
	thousands								
Paid.....	109	103	99	105	98	99	100	95	91
Farm Operators.....	443	403	396	362	335	337	367	325	320
Unpaid Family.....	136	142	135	126	110	122	127	114	121
Total.....	688	648	630	593	543	558	594	534	532

Source: *The Labour Force*, Catalogue No. 71-001, Dominion Bureau of Statistics.

Quebec and British Columbia this seven-month average was larger in 1968 than in 1967, it was less in Ontario and the Prairie Provinces and unchanged in the Atlantic Provinces (Table 3).

As a proportion of employment in all industries in Canada, farm employment remained unchanged in 1967 at 7.6 per cent. The five-year averages of the agricultural share of total employment for the periods 1958-62 and 1963-67 are 11.6 per cent and 8.7 per cent, respectively.

Farm employment data reveal that the 1967 farm employment increase was largely due to a 10.9 per cent jump in the number of unpaid family workers, while the increase in hired workers and farm operators was one per cent or less (Table 4). This fact reflects higher unemployment in the non-farm labor market which enabled fewer persons living on farms to get seasonal employment off the farm. The trend appears to be continuing this year which is substantiated by the average number of unpaid family workers for the 1968 January-July period, which has exceeded the equivalent 1967 average by over 6 per cent. On the other hand, numbers of hired labor and farm operators were down 4.2 per cent and 1.5 per cent for the first seven months. The level of farm employment in 1968 is expected to be essentially the same as in 1967 but may resume its downward trend again in 1969.

Since unemployment insurance was extended to qualified farm employees on April 1, 1967, the number of participants, contributors as well as claimants, has been growing rather slowly. Approximately 40,000 employers have registered with the Unemployment Insurance Commission since inception of the program. Employer-employee contributions between April 1, 1967 and August 31, 1968 totaled \$2,471,000 and government contributions amounted to \$494,000. In the same period, \$2,804,000 was paid in insurance benefits. After benefit payments to farm employees were introduced in October 1967, the number of claimants rose quickly and reached a high of 6,310 in February 1968. It remained fairly large until April and then dropped to only 280 in July and 200 in August. In February, the farm employees drawing unemployment insurance represented over 11 per cent of all paid workers employed in agriculture in that month, while the equivalent proportion for July and August was 0.2 per cent.

Farm Machinery and Equipment

Total expenditures for the purchase of farm machinery and equipment reached a record-high of \$760.4 million in 1966 but were slightly less in 1967. Although there were indications late in 1967 that farm machinery sales might turn upward again early

this year, this expectation has not materialized so far in 1968. On the contrary, farm implement sales in the first six months of 1968 were 20 per cent below the same period in 1967. The slump was most noticeable in the Prairie Provinces with sales reported down 23 per cent in Manitoba, 34 per cent in Saskatchewan, and 27 per cent in Alberta; sales were 8 per cent less in Ontario and down about 9 per cent in the Atlantic Provinces. On the other hand, Quebec sales were up more than 8 per cent and British Columbia sales increased by 3 per cent.

Machinery operating expenses, including fuel and lubricants, repairs, insurance, etc., amounted to \$539 million in 1967. This was 3.4 per cent larger than in 1966.

It is estimated that in 1967 average capital and operating expenditures for machinery amounted to \$3,068 per farm in Canada. This was 2.7 per cent above the 1966 average but far below the 1963-67 average annual increase of 10.9 per cent. In 1967, these expenditures per farm were highest in Alberta with \$4,221, somewhat less in Saskatchewan and Manitoba, and smallest in Nova Scotia at \$1,644. The averages for Prince Edward Island and British Columbia also were below the \$2,000 level. While the increase over the 1966 average was by far the largest in Quebec, there were considerable decreases in Saskatchewan and Manitoba.

There is evidence to suggest that total capital and operating costs for machinery and equipment in 1968 will be down considerably from 1967 levels, with gross capital investment declining further and machinery operating expenditures rising moderately. After a two-year slowdown, an expansion is again probable in 1969.

Feeds

Shipments of complete feeds by manufacturers in 1967 totaled 1.99 million tons, up 11.9 per cent from 1966. Tonnage went up 28 per cent for swine feeds, 17 per cent for cattle and calf feeds, and 6 per cent for poultry feeds. Shipments between January and June, 1968, were five per cent less than in the same period in 1967, however.

In 1967, shipments by manufacturers of premixes and supplements amounted to 604,000 tons, of which 1,700 tons were exported. This was five per cent above 1966 shipments, but considerably below the 1965-66 increase of 13.7 per cent. Tonnage of swine feed supplements and premixes was up 15 per cent and of cattle and calf supplements was up 15 and 4.2 per cent respectively; shipments of poultry feed supplements were down, however, by over 3 per cent. During the first five months of 1968, shipments of supplements for cattle and calves were larger than

those for the same period in 1967 while shipments of supplements for swine and poultry were considerably less.

Expenditures on feed purchased through commercial channels increased by 11.1 per cent from \$505.7 million in 1966 to \$561.5 million in 1967. This increase was, however, less than the 14.2 per cent increase between 1965 and 1966. Seventy-seven per cent of farm expenditures for feed in 1967 were accounted for by feed purchases in Ontario and Quebec. Although the total value of purchased feed in the Prairie Provinces has been relatively small, the 1967 increases in Manitoba and Saskatchewan were substantial, amounting to 37 per cent and 22 per cent, respectively.

Fertilizers

The total amount of fertilizers sold for agricultural use in Canada in 1967—about 2.2 million tons—exceeded 1966 by 13.8 per cent. In 1966, the increase was slightly over twenty per cent. The most recent five year average annual rate of increase was 13.9 per cent. In terms of nutrient tonnage sold, nitrogen showed the largest increase in 1967, amounting to 26.8 per cent, followed by potash with 13.9 per cent and phosphoric acid with 12.1 per cent. The trend

towards a rising proportion of fertilizer sales in form of fertilizer materials and a declining share as mixtures has been continuing (Table 5).

Total farm expenditures for fertilizer and lime in 1967 amounted to \$195.2 million, 17.4 per cent above the 1966 level. While total outlays for fertilizers declined in the Maritime Provinces, with the exception of Nova Scotia, they increased substantially in the Prairie Provinces. The increases were about 41 per cent in Alberta, 34 in Saskatchewan, 27 in Manitoba, 10 in Ontario and 5 per cent in Quebec. Alberta farmers spent \$37.4 million for fertilizers, second to Ontario's \$67 million.

In 1967, fertilizer expenditures averaged \$2.80 per acre of land under crops for Canada as a whole, 16.7 per cent above the 1966 level and 27.3 per cent above the 1963-67 annual average. In the Maritimes, \$12.40 were spent on fertilizers and lime per crop acre, as compared with \$8.00 in Ontario, \$5.90 in British Columbia, \$4.80 in Quebec, and \$1.58 in the Prairie Provinces. However, the 1963-67 average annual increase was largest in the Prairies with 34 per cent, and smallest in the Maritimes with 10 per cent. The 1967 increase was slightly above the five-year average in the former region, while there was a small decrease in the latter (Table 6).

TABLE 5—TOTAL FERTILIZER SOLD FOR USE IN CANADA, AND AMOUNT OF NITROGEN, PHOSPHORIC ACID AND POTASH CONTAINED IN FERTILIZER SOLD, SELECTED PERIODS, 1953 TO 1967

Year Ended June 30	Fertilizer Sold			Nutrients Contained		
	Total	Materials	Mixtures	N	P ₂ O ₅	K ₂ O
	thousand tons	per cent	per cent	thousand tons		
1953-1957.....	806.2	19.4	80.6	44.7	121.8	73.4
1958-1962.....	987.1	25.7	74.3	72.8	159.8	94.1
1963.....	1,256.8	35.7	64.3	122.3	223.3	112.0
1964.....	1,454.3	41.9	58.1	165.6	264.2	120.7
1965.....	1,593.6	43.0	57.0	188.2	293.8	135.4
1966.....	1,917.9	47.5	52.5	240.5	367.6	156.3
1967.....	2,183.4	51.4	48.6	305.0	412.2	178.1
1963-1967.....	1,681.2	43.9	56.1	204.3	312.2	140.5

Source: *Fertilizer Trade*, Annual, Cat. No. 46-207, Dominion Bureau of Statistics.

TABLE 6—FARM FERTILIZER EXPENDITURES PER ACRE OF LAND UNDER CROPS, CANADA, BY REGIONS, SELECTED PERIODS, 1958 TO 1967

	Maritimes	Quebec	Ontario	Prairies	British Columbia	Canada
	dollars per acre					
1958-1962.....	6.90	2.50	4.30	.28	4.40	1.20
1963.....	8.20	3.00	5.80	.51	5.10	1.60
1964.....	8.30	3.10	6.60	.75	5.10	1.90
1965.....	10.00	3.60	7.28	.86	5.20	2.10
1966.....	12.40	4.60	7.30	1.16	5.60	2.40
1967.....	12.40	4.80	8.00	1.58	5.90	2.80
1963-1967.....	10.30	3.80	7.00	.97	5.40	2.20

Sources: *Handbook of Agricultural Statistics*, Part I—Field Crops, Cat. No. 21-507, Dominion Bureau of Statistics.
Census of Canada, Agriculture, Cat. No. 96-293, Dominion Bureau of Statistics.
Handbook of Agricultural Statistics, Part II—Farm Income, Cat. No. 21-511, Dominion Bureau of Statistics.
Farm Net Income, Annual, Cat. No. 21-202, Dominion Bureau of Statistics.

The average annual amount per farm spent on fertilizers was \$465 for Canada in 1967, representing a 20 per cent increase over the preceding year. The amount was largest in New Brunswick with \$731, followed by Prince Edward Island and Ontario; it was smallest in British Columbia with \$297.

Agricultural Pesticides

Sales of pest control products for agricultural use in 1967 exceeded those of 1966 by 13.4 per cent and amounted to \$45.6 million. Sales of herbicides at \$19.7 million accounted for the largest portion among the major applications of pest control products, showing an increase over the 1966 level of 22.4 per cent. The sale of products for crop, seed and livestock treatments declined in 1967, while sales of products for all other uses increased from \$7 million to \$12.5 million (Table 7).

In 1968, sales of agricultural pest control products are expected to approach \$50 million and this trend

of increasing use will continue into 1969. Specialized uses of pesticides are likely to expand, and herbicides will account for the main share of the expansion.

Because of resistance being developed by some species to pesticides, and because of a growing pesticide residue problem, research in the pest control area has been intensifying in recent years. More emphasis is being given to studies of pest control through radar, atomic energy and beneficial parasites and predators. Inroads are also being made in the application of control products. Aerial spraying has become more common and the practice is expected to increase further next year.

Farm Capital

In 1967, the value of farm real estate, machinery and equipment, and livestock was estimated at \$21,186 million, an increase of 10.1 per cent over 1966. This increased growth was below 1966 but was the second largest of the past decade. The average

TABLE 7—SALES OF PEST CONTROL PRODUCTS FOR AGRICULTURAL USE, CANADA, SELECTED PERIODS, 1958 TO 1968^a

Period Ending September 30	Herbicides	Crop and Seed Treatments ^b	Livestock Treatments ^c	Other Agricultural Uses	Total ^d
million dollars					
1958-1962 ^e	8.7	10.6	2.2	f	21.5
1963.....	12.7	13.5	2.5	f	28.7
1964.....	14.7	10.3	2.4	f	27.2
1965.....	17.2	10.1	2.6	f	29.9
1966.....	16.1	11.7	5.5	7.0	40.2
1967.....	19.7	8.8	4.7	12.5	45.6

^a Data refer only to the sale of products registered with the Department of Agriculture as required under the terms of the Pest Control Products Act.

^b Crop treatment includes agricultural dusts and sprays for use on field, vegetable and orchard crops, and in greenhouses. It does not include preparations for use on or around livestock, for weed control or home, garden, or industrial uses.

^c Excludes medicated feeds.

^d Excludes household and industrial insecticides and rodenticides.

^e Annual average.

^f This category was not shown before 1966. The 1966 and 1967 data include sales of products belonging to one of the three other use categories but which are not shown there to avoid disclosure of information on individual companies.

Source: *Sales of Pest Control Products by Canadian Registrants*, Annual, Catalogue No. 46-212, Dominion Bureau of Statistics.

TABLE 8—VALUE OF FARM CAPITAL, CANADA, SELECTED PERIODS, 1958 TO 1967

Year	Real Estate	Machinery and Equipment	Livestock	Total	Annual Rate of Increase
million dollars					per cent
1958-62 ^a	8,217.5	2,549.5	1,947.8	12,714.8	4.8
1963.....	9,639.2	2,781.8	2,119.9	14,541.0	6.3
1964.....	10,675.6	2,948.2	2,166.4	15,790.1	8.6
1965.....	12,039.3	3,140.2	2,107.5	17,286.9	9.5
1966.....	13,466.8	3,393.1	2,364.1	19,224.0	11.2
1967.....	14,942.3	3,708.9	2,534.8	21,186.0	10.1
1963-67 ^a	12,152.7	3,194.4	2,258.5	17,605.6	9.1

^a Annual average.

Source: *Quarterly Bulletin of Agricultural Statistics*, Cat. No. 21-003, Dominion Bureau of Statistics.

annual increase for the 1963-67 period was 9.1 per cent as compared with 4.8 per cent for the 1958-62 period (Table 8). When measured in real terms, or constant dollars, the total capital in 1967 exceeded that for 1957 by about 15 per cent. The increase in 1967 was 2.4 per cent over 1966, as compared to a 1.6 per cent increase in 1966 over 1965; this was entirely due to an expansion in the livestock and machinery portions of total capital (Table 9).

The value of farm real estate in 1967 was \$14,942 million, 11.0 per cent higher than in the preceding year. This increase is close to the trend for the 1963-67 period when farm real estate values rose by 10.8 per cent annually. The five-year average annual increase for 1958-62 was less than one-half this rate, 5.2 per cent.

Farm machinery and equipment was valued at \$3,709 million in 1967. This was about 9.3 per cent more than in 1966. Farm assets in this category expanded in value by 6.9 per cent annually between 1963 and 1967, while in the preceding five-year period, 1958-62, the rate was only 2.4 per cent.

Livestock and poultry on farms reached a value of \$2,535 million in 1967, an annual advance of 7.2 per cent but less than the 1966 growth of 11.8 per cent. Unlike the other tangible asset categories, average annual growth in value of livestock and poultry was smaller for the 1963-67 period than for the 1958-62 period. The rates of change were 4.4 per cent and 6.7 per cent, respectively.

Expansion in the value of total capital stock is expected to continue throughout 1968 and 1969 but at diminishing rates. By the end of 1969, the value of farm real estate, machinery and equipment, and livestock will probably exceed \$25 billion. The value of other farm assets is also growing appreciably.

Net Investment in Construction and Machinery

Farm expenditures for new construction are estimated at \$250 million for 1967, 2.9 per cent higher than in the preceding year. This was considerably below the 18.1 per cent increase in 1966. Capital expenditures for farm machinery and equipment totaled \$748.5 million in 1967, 1.6 per cent below the 1966 level. Total depreciation charges continued to increase in 1967 at a rate of 9.4 per cent, compared with the 1963-67 annual average of 7.7 per cent, and reached a record of \$585.6 million. Total net investment in agricultural construction, machinery and equipment amounted to \$413 million in 1967, a decrease of 11.8 per cent in comparison with 1966 levels (Table 10).

Depending on 1968 farm income and the 1969 farm credit situation, gross capital expenditures for buildings and machinery in 1969 should continue to expand while growth in net investment is unlikely to show much change.

Land Prices

Land prices continued an upward trend in all provinces during 1967. The estimated rate of national increase of 10 per cent is similar to that of 1966. In British Columbia, Nova Scotia, New Brunswick and Quebec, increases during 1967 are all estimated to have been less than 5 per cent. The rate of increase in Prince Edward Island appeared to be somewhat higher. In the Prairie Provinces, the rate of increase in land prices appears to be leveling off at about the present national average. The increase in prices in Saskatchewan of about 10 per cent was approximately one-half that of two years earlier. The situation in Ontario differed from the rest of the country.

TABLE 9—VALUE OF FARM CAPITAL IN CONSTANT 1949 DOLLARS, CANADA, 1949, 1955, 1960-67

	Real Estate ^a	Constant Capital Investment			Index
		Machinery and Equipment ^b	Livestock ^c	Total	
		million dollars			1949 = 100
1949.....	4,716.8	1,415.5	1,370.8	7,503.2	100.0
1955.....	5,051.6	1,818.2	1,583.0	8,452.8	112.6
1960.....	5,307.7	1,603.4	1,887.4	8,798.5	117.3
1961.....	5,294.4	1,553.9	1,956.9	8,805.3	117.4
1962.....	5,367.6	1,568.0	1,905.2	8,840.8	117.8
1963.....	5,355.1	1,613.6	2,042.3	9,011.0	120.1
1964.....	5,337.8	1,669.4	2,151.3	9,158.5	122.1
1965.....	5,350.8	1,744.5	1,933.5	9,028.8	120.3
1966.....	5,386.7	1,832.1	1,952.2	9,171.0	122.2
1967.....	5,384.6	1,942.9	2,067.5	9,395.0	125.2

^a Real estate values are deflated by the index of average prices for farm real estate.

^b Machinery values are deflated by the index of farm machinery prices.

^c The animal products price index was used as a deflator.

Source: Economics Branch, Canada Department of Agriculture.

TABLE 10—FARM CAPITAL EXPENDITURES FOR CONSTRUCTION AND MACHINERY AND EQUIPMENT, DEPRECIATION CHARGES, AND NET INVESTMENT, CANADA, 1963 TO 1967

Year and Period	Capital Expenditures			Depreciation Charges	Net Investment in Construction and Machinery
	Construction	Machinery and Equipment	Total		
			million dollars		
1963.....	188.3	526.2	714.5	423.0	291.5
1964.....	194.6	595.4	789.9	453.2	336.7
1965.....	205.8	675.7	881.5	489.3	392.2
1966.....	243.0	760.4	1,003.5	535.4	468.1
1967.....	250.1	748.5	998.6	585.5	413.0
1963-1967*.....	216.4	661.2	877.6	497.3	380.3

* Annual average.

Sources: *Private and Public Investment in Canada*, Cat. No. 61-205, Annual, Dominion Bureau of Statistics.
Farm Net Income, Cat. No. 21-202, Annual, Dominion Bureau of Statistics.

After moderate land price increases in 1964 and 1965, an increase of about 10 per cent occurred in 1966 and accelerated in 1967 to about 15 per cent over 1966 levels. A considerable portion of Ontario land price increases is attributed to the effects of urban growth.

Land prices in 1968 are expected to again increase but at a slightly slower rate than in 1966 or 1967. The possible exception is in Ontario where, during the last two years, the pattern of increases appears to have been similar to that which occurred in the Prairie Provinces between 1963 and 1965. Generally, tighter credit conditions, higher interest rates and the prospective market conditions for some crops are expected to take some of the pressure off land prices. A counterbalancing effect due to the continued effort on the part of farmers to achieve more efficient units, increased productivity of land through larger applications of fertilizer, and the production of new high-value crops in regions where they were not previously grown, will tend to maintain a strong upward pressure on prices, particularly in Ontario and the Prairie Provinces.

Farm Credit

The amount of credit supplied to farmers has been increasing at an estimated rate of approximately 11.4 per cent per year since 1960. In 1968, the rate of increase in credit extended is expected to be much smaller and the total amount of credit used may even decline from that of 1967. Present estimates indicate that about \$2,179 million was extended to farmers in 1967. This represented an increase of \$233 million over 1966 and \$369 million over estimates for 1965. The tighter credit situation in 1968 coupled with higher interest rates and apprehension on the part of farmers regarding future markets have all been factors influencing the use of farm credit this year. While some factors are tending to stabilize interest rates, the

average rate of interest on all farm credit extended in 1969 is expected to be higher than in 1968.

The liabilities of farmers continued to increase in 1967 and are presently estimated at about \$3,860 million. This represents an increase of \$484 million over 1966 and \$912 million over estimates for 1965. A slight drop in the rate of increase is probable in 1968. The average interest rate in 1967 is estimated to have been 6.6 per cent and the interest charges paid \$256 million (Table 11).

Farm liabilities presently represent 18.2 per cent of the value of farm real estate, machinery and equipment, and livestock. When all farm assets are taken into account, except the value of household furnishings and equipment, and farmer investment in co-operatives, farm debts are approximately 16.5 per cent of farm assets.

Crop Insurance

During 1968, crop insurance was introduced in Quebec and programs in effect in Ontario and the Western Provinces continued to expand. In the crop year, 1967-68, approximately 33,400 farmers had crop insurance coverage valued at \$91 million on which the total premium amounted to nearly \$7 million. The indemnities paid in the 1967-68 crop year amounted to \$2.8 million. In 1968, some 65,000 farmers have taken out coverage of about \$187 million on which total premiums amounted to over \$12 million (Table 12). Programs in effect cover an increasingly wide variety of crops.

Prices of Commodities and Services Used by Farmers

The composite price index (1935-39 = 100) of goods and services used by farmers in 1967 was 6.4 per cent above the 1966 index. In April 1968, the same index shows a 4.9 per cent increase over the same month a year ago. The overall increase in 1968 is expected to be about the same as in 1967.

TABLE 11—FARM CREDIT AND CAPITAL INVESTMENT IN FARMS, CANADA, 1963 TO 1967

Year	Farm Credit		Investment in Real Estate, Machinery and Equipment, and Livestock	Liabilities as a Per Cent of Capital Investment
	Amount Extended	Per cent Increase	Amount Outstanding	
	millions of dollars	per cent	millions of dollars	per cent
1963 ^a	1,438.9	12.5	2,261.9	14,541.0
1964 ^a	1,608.4	11.8	2,568.9	15,790.1
1965 ^a	1,810.7	12.6	2,947.7	17,286.9
1966.....	1,955.8	8.0	3,375.7	19,224.0
1967 ^b	2,179.3	11.4	3,859.9	21,186.0

^a Revised estimates on credit extended and credit outstanding.

^b Preliminary.

Source: Economics Branch, Canada Department of Agriculture.

TABLE 12—CROP INSURANCE IN CANADA, CROP YEARS 1963-64 TO 1968-69

Crop Year	Number of Farmers Insured	Coverage	Total Premium Cost	Indemnities Paid
			dollars	
1963-64.....	7,452	15,971,340	1,374,545	1,265,823
1964-65.....	8,626	17,868,885	1,539,255	432,017
1965-66.....	13,420	26,827,019	2,308,152	615,771
1966-67.....	24,508	51,788,499	4,181,174	1,248,791
1967-68.....	33,410	91,220,309	6,901,309	2,804,051
1968-69.....	65,340	186,878,937	12,490,500	^a

^a Not presently available.

Source: Crop Insurance Division, Canada Department of Agriculture.

In 1967, prices of equipment and materials used by farmers went up by 3.6 per cent. In this category, machinery prices increased by 3.1 per cent, and a somewhat larger increase is expected in 1968. Prices of building materials increased by 3.6 per cent but this year's increase is expected to be twice as great. Prices of gasoline and lubricants advanced 3.0 per cent and could be up as much as 5 per cent for 1968. Feed prices increased by 5.8 per cent in 1967 but a downward trend since mid-year 1967 will presumably last throughout 1968. Fertilizer prices moved up by 5 per cent in 1967, are expected to be slightly higher in 1968 and may remain at that level for 1969. Prices of hardware used by farmers are likely to be up in 1968 by 5 per cent or more.

Taxes and interest rates in 1967 exceeded 1966 levels by 5.8 per cent. Due to rising estate values and increasing financial commitments of governments, taxes are expected to increase in 1968 and 1969. Interest rates will likely be somewhat higher.

Farm wage rates exhibited the largest gains in 1967 compared to other inputs and amounted to 10.5 per cent. Increases are again expected to exceed most of those in all other input categories in 1968 but in percentage terms are expected to be slightly below the

1967 levels. Average farm wages without board amounted to \$268 per month in May 1968 as compared to \$251 for the same month in 1967. On an hourly basis, wages increased from \$1.36 to \$1.41.

The Dominion Bureau of Statistics is presently developing improved input price indexes which are expected to be available in 1969.

Purchased Services

Along with the rapid technological developments in the past twenty years, there has been a rapid emergence of agricultural service industries. More and more farm inputs are produced off the farm and as these inputs become more sophisticated, additional services are required to ensure their correct and efficient use. Industry representatives are now performing an important extension function along with sales, and surveys have revealed that in some areas industry-farmer contacts exceeded extension-farmer contacts. A trend is also discernible towards larger farm service centers providing a variety of services to farmers.

One of the service industries enjoying substantial growth is agricultural aviation. National Research

TABLE 13—FARM CASH RECEIPTS, CANADA

	Average 1956-60	Average 1961-65	1966	1967
thousand dollars				
Wheat.....	430,506	601,064	803,673	761,622
Wheat, C.W.B. payments.....	69,772	174,108	200,151	270,192
Oats.....	32,503	33,444	36,582	24,709
Oats, C.W.B. payments.....	2,679	5,722	6,850	12,331
Barley.....	82,335	67,110	83,630	95,726
Barley, C.W.B. payments.....	6,849	12,090	22,218	29,256
C.W.B. net cash advance payments.....	9,020	— 4,709	— 4,667	6,569
Rye.....	6,626	7,735	15,192	7,773
Flaxseed.....	49,857	48,852	62,289	46,223
Rapeseed.....	4,997	16,739	42,718	43,994
Soybeans.....	10,953	14,846	19,793	21,504
Corn.....	13,139	17,618	31,132	31,752
Sugar beets.....	14,353	16,853	12,179	13,051
Potatoes.....	52,125	62,005	73,671	53,308
Fruits.....	44,021	63,192	75,883	81,778
Vegetables.....	61,673	75,915	85,418	93,908
Tobacco.....	82,124	99,555	117,911	156,740
Other crops.....	56,768	75,420	84,772	87,381
Total crops.....	1,030,300	1,387,559	1,769,395	1,837,817
Cattle and calves.....	499,727	661,109	888,299	922,333
Hogs.....	292,079	323,987	421,016	408,283
Sheep and lambs.....	10,187	10,096	9,292	8,257
Dairy products.....	467,021	519,748	584,429	629,438
Poultry.....	140,726	168,002	232,569	224,740
Eggs.....	142,590	141,904	169,755	148,648
Other livestock and products.....	35,142	43,277	49,372	50,952
Total livestock and products.....	1,587,472	1,868,123	2,354,732	2,392,651
Forest and maple products.....	37,750	34,313	37,560	35,175
Dairy supplementary payments.....	—	3,382	68,591	103,229
Deficiency payments.....	1,733	3,010	8,410	10,166
Cash receipts from farming operations.....	2,657,255	3,296,387	4,238,688	4,379,038
Supplementary payments.....	33,282	28,417	41,345	6,137
Total cash receipts.....	2,690,537	3,324,804	4,280,033	4,385,175

Source: Dominion Bureau of Statistics publications, *Handbook of Agricultural Statistics* Catalogue No. 21-511 and *Farm Cash Receipts*, Catalogue No. 21-001.

Council survey reports indicate that the 89 commercial and private enterprises who participated in the study in 1966, employed 244 pilots to carry out aerial applications of chemicals and seeds. Over 19,500 hours were flown to treat almost five million acres of forest and agricultural land, the latter accounting for somewhat less than one-third of the total. It is estimated that agricultural aerial applications increased by almost 90 per cent between 1961 and 1966, and that by 1976 upwards of 3.5 million acres will be treated from the air.

In 1966, commercial operators in Ontario, Quebec, New Brunswick, Nova Scotia and British Columbia charged from \$4.00 to \$7.95 per acre for flying, pesticides included. The charges for weed control ranged from \$2.00 per acre for the application of 2,4-D on

grains, to about \$10.00 for atrazine applications. Charges for liquid application of fertilizers on tobacco and corn varied from \$5.95 to \$9.25 per acre.

In the Prairie Provinces, commercial operators treated 394,000 acres for weed control, 28,000 acres for brush control and 1,400 acres for plant disease control and defoliation. Privately operated aircraft treated 309,000 acres for agricultural purposes. For weed control in cereal crops, 90 cents per acre was charged for application of 2,4-D. Control of wild oats cost \$3.50 to \$5.00 per acre. Insect control charges for applications of one gallon per acre ranged from \$1.10 for aphids in cereal crops to \$3.50 for spraying against webworm in sugar beets. Brush control over established pasture land ranged from \$1.90 to \$5.00 per acre.

TABLE 14—FARM OPERATING EXPENSES AND DEPRECIATION CHARGES, CANADA^a

	Average 1956-60	Average 1961-65	1966	1967
thousands of dollars				
Taxes ^b	111,823	133,254	147,820	153,460
Gross farm rent.....	77,639	111,323	158,505	136,393
Wages to farm labour.....	200,585	237,960	258,437	281,528
Interest on indebtedness ^c	83,372	146,739	218,541	237,522
Total machinery expenses ^d	374,610	441,725	521,604	539,590
Fertilizer and lime.....	60,793	106,166	166,257	195,184
Other crop expenses ^e	66,390	87,141	103,405	110,742
Feed ^f	313,747	389,438	505,743	561,518
Other livestock expenses ^g	40,289	56,805	83,433	100,854
Repairs to buildings ^h	62,367	76,615	100,861	102,933
Electricity and telephone.....	27,171	34,070	37,777	38,764
Miscellaneous ⁱ	101,948	135,274	168,922	178,093
Total operating expenses.....	1,520,734	1,956,510	2,471,305	2,636,581
Depreciation on buildings.....	97,985	128,202	167,811	184,931
Depreciation on machinery.....	246,350	301,879	367,637	400,662
Total operating and depreciation.....	1,865,069	2,386,591	3,006,753	3,222,174

^a Excludes Newfoundland.

^b Owned land and buildings only.

^c Mortgage payments on owned land and buildings, together with interest payments on all other farm business debt.

^d Petroleum, diesel oil and lubricants, machinery repairs, tires, anti-freeze, licences, insurance, etc.

^e Pesticides, nursery stock, irrigation, containers, seed and twine.

^f Purchases through commercial channels only.

^g Livestock purchases, artificial insemination charges, purebred livestock registration fees and veterinary expenses.

^h Fencing, custom work, insurance and other supplies and services not previously specified.

Source: Dominion Bureau of Statistics publications *Handbook of Agricultural Statistics*, Catalogue 21-511 and *Farm Net Income*, Catalogue No. 21-202.

GRAINS, FEEDS AND OILSEEDS

WHEAT

World Situation 1967-68

World wheat production (excluding Mainland China) reached 10,200 million bushels in 1967-68, 2 per cent less than the record crop harvested in the previous year, but 10 per cent above the 1961-62 to 1965-66 five year average. After a decline in beginning carryover stocks over a period of years, which reached a low in 1966-67, they increased 8 per cent in 1967-68 in the five major exporting countries (U.S.A., Canada, Australia, Argentina, and France) to 1,161 million bushels. With increased supplies in most importing countries, world trade declined for the second consecutive year to a level of about 1,950 million bushels.

The decline in import demand, beginning in 1966-67, continued into 1967-68 and increased supplies in the major exporting countries led to intensified export competition in world markets. Commercial exports from the United States fell slightly, but increased shipments on special terms pushed total United States exports to an estimated 20 million bushels above the previous year and 12 million bushels above the 1967-68 export target of 750 million bushels. While Australian exports are expected to be down 96 million bushels to 220 million bushels, ample carryover stocks from the bumper 1966-67 crop cushioned the effect of a poor 1967-68 harvest. Argentine exports, temporarily suspended in 1967 because of a shortage of supplies, are expected to be little changed from the previous year at 85 million bushels. French exports increased 54 million bushels to 169 million bushels due to a larger crop and higher export subsidies, especially to more distant markets. Canadian exports were down by 179 million bushels to 336 million.

International wheat prices, which had begun to fall in the latter months of the 1966-67 season, continued to fall throughout the first half of 1967-68 reflecting the bearish world trade situation. Prices began leveling off early in 1968 and in March 1968, export prices of most wheats averaged about 10 per cent lower than the previous year. The decline was less pronounced in import markets due to a moderate rise in freight rates with the closing of the Suez Canal in June 1967.

For the first time since 1949 wheat was traded for most of the 1967-68 season without an internationally agreed price range. The price provisions of the 1962 International Wheat Agreement lapsed in August 1967 and the new price range of the 1967 International Grains Arrangement became effective on

July 1, 1968. The new minimums are at a level roughly equivalent to the average world market prices during the previous five years. For part of 1967-68, wheat prices were below this level, but prior to the date of implementation the major exporters took action to ensure that the price provisions of the I.G.A. would be honored.

Canadian Situation 1967-68

Stocks of wheat carried into the 1967-68 crop year totaled 577 million bushels, 157 million bushels more than August 1, 1966 and 85 million bushels more than the average beginning carryover for the previous five year period. Although it was dry in 1967, production did not fall as greatly as was anticipated. The harvest, at 593 million bushels, was 28 per cent lower than the record 1966 crop, but 5 per cent above the 1961-62 to 1965-66 five year average. Total wheat supplies of 1,170 million bushels were 6 per cent smaller than the previous year but 11 per cent above the 1961-62 to 1965-66 average. Farmers' marketing of wheat during the 1967-68 season amounted to 453 million bushels or 29 per cent less than the record marketings of the previous year. At 167 million bushels, domestic consumption was up 8 per cent because of the larger quantities of wheat fed to livestock in western Canada. In total, 63 million bushels of wheat were fed, of which 10 million bushels moved under the Canadian Livestock Feed Board assistance program. In addition, 40 million bushels were used for seed and 63 million bushels went for human food. Although domestic consumption of wheat flour was up slightly, total production of flour was down 6 per cent to 3,760 million pounds.

Wheat and wheat flour exports totaled 336 million bushels, 35 per cent below the previous year and 26 per cent below the 1961-62 to 1965-66 average. The Canadian share of total world wheat trade dropped to 17.2 per cent from 25.1 per cent in 1966-67 and an average of 23.5 per cent during the previous five years. Exports to developed countries fell 23 per cent to 159 million bushels, due to smaller imports by some western European countries, South Africa and Japan, and strong competition from other exporters. Shipments to developing countries declined by 42 per cent to 43 million bushels as the result of reduced food aid shipments to India and Pakistan and a slight decline in commercial trade. For the second consecutive year exports to Communist countries decreased, falling to 133 million bushels in 1967-68, a drop of 43 per cent from the previous year. Although there was a slight increase in exports to Czechoslovakia, there

was a sharp decline in wheat trade with all other Communist trading partners. Trade with East European countries and the U.S.S.R. was down on account of their good production in 1967 which helped to build up diminished stocks. Canadian exports to Mainland China were affected by the internal problems and the larger crop in that country, and by the availability of large world supplies of low priced wheat.

Canadian wheat prices, which are the same for both the domestic and export market, averaged \$1.94 per bushel for No. 1 Northern, in store at the Lakehead during 1967-68, compared with the record \$2.12 per bushel in 1966-67, and the previous five year average price of \$1.98 per bushel. The initial payment to producers increased from \$1.50 per bushel for No. 1 Northern, in store at the Lakehead in 1966-67, to \$1.70 per bushel in 1967-68. For the period prior to the commencement of the International Grains Arrangement, the Canadian government paid into the Canadian Wheat Board pools, the difference between the sale price and a price equivalent to the new I.G.A. minimum of approximately \$1.95½ per bushel for No. 1 Northern, in store at the Lakehead, for all sales made below this minimum.

World Outlook 1968-69

Opening stocks for the current season in the five main exporting countries are estimated at 1,348 million bushels, 16 per cent larger than last year. Stocks are up sharply in Canada and the United States, up slightly in France and Argentina and down slightly in Australia.

Present indications suggest a world harvest (excluding Mainland China) of about 10,000 million bushels or a little less than the two previous years, but 9 per cent above the 1961-62 to 1965-66 five year average of 9,200 million bushels. The total crop in Western Europe is estimated to be down slightly from the last two years, with reduced yields more than offsetting increased acreage. Heavy rain damage to grain crops in Britain affected the quality and volume of production. However, the French harvest is expected to be equal to the near record level last year of 537 million bushels. Reports indicate a reduced level of production in Eastern Europe due to drought in some areas; and less than favorable weather in the U.S.S.R. may hold production in that country near the 1967 level of 3,000 million bushels. Little information is available on the harvest situation in Mainland China. The North African harvest is expected to be better than last year. Turkey and Iran have harvested bumper crops but production is down slightly in other Middle East countries. Both India and Pakistan

have harvested record crops, each 39 per cent larger than last year. Excellent weather was the key factor together with improved seed, heavier application of fertilizer and better cultural practices. The 1968 acreage allotment in United States was cut back to 59.3 million acres from the high level of 68.2 million acres in 1967. However, a record average yield of 28.3 bushels per acre is estimated to have increased production 4 per cent to 1,588 million bushels. In the southern hemisphere, crops are not yet harvested, but it is estimated that Australian producers planted a record 25 million acres and with reported above average weather conditions, production is expected to approach the record 1966-67 crop of 463 million bushels. If the three year drought breaks in Argentina, the 15 million acres apparently planted could bring a substantial increase in production over the last few years. It is presently estimated that the five major exporting countries will harvest crops in excess of the 1966 record of 3,250 million bushels. However, the final outcome will not be known until late December when crops are harvested in the southern hemisphere.

World trade in wheat continued to be slow in the early months of the current season but is expected to be equal to or slightly larger than last year's 1,950 million bushels. Lower levels of production in some importing countries are expected to lead to a slightly improved import demand in 1968-69. Increased carryover stocks in exporting countries, combined with a record harvest will provide ample exportable supplies in 1968-69. Hence the intense competition among exporters in wheat markets which characterized world wheat trading in 1967-68 is expected to continue in 1968-69 with resulting pressure on world wheat prices. Nevertheless, the International Grains Arrangement will provide a floor at which world prices can be maintained.

The patterns of world trade established in 1967-68 are expected to continue in 1968-69 with only a few significant variations. Exports to developed countries which have been declining in recent years, may continue to decline with increased purchases by Japan more than offset by reduced shipments to Western Europe and South Africa. The developing countries will continue to require wheat to meet their food grain needs and for stock replenishment but as in previous years, their imports will depend largely on aid commitments and other concessional supplies. However, technological advances have enabled many of the developing countries to markedly increase their own grain production. There are indications that the drought which has affected production in some of the East European countries may lead to increased imports by some of these countries from the west, but

this will depend largely on the level of exportable supplies in the U.S.S.R. However, Mainland China may continue to require large wheat imports in 1968-69.

Canadian Outlook 1968-69

Seeded acreage declined by 2 per cent to 29.4 million acres. Across most of the Prairies the growing season was quite dry but sufficient soil moisture reserves from spring rains helped to carry the crop into August. Especially heavy rains in August and early September delayed harvesting operations and created some problems with handling of tough and damp grain. The September 15 forecast of production places the crop at 628 million bushels, up 6 per cent from last year. The yield is forecast at 21.3 bushels per acre compared with 19.7 last year. Wheat grades will be lower this year due mainly to frost and sprouting. Included in the production estimate is the Ontario winter wheat crop of 14.9 million bushels, slightly lower than last year.

With the return of orderly marketing following the implementation of the International Grains Arrangement, Canada's exports to developed importing countries in 1968-69 are expected to increase over the low level of shipments last year and could total as much as 180 million bushels. Food aid shipments to developing countries may be up slightly over last year. Total food aid shipments will likely be in the region of 35 to 40 million bushels and commercial trade with developing countries will boost the total exports to these countries in 1968-69 to about 50 million bushels. Exports to Communist countries should rise this year. The balance outstanding on July 31 under the current three year agreement with the U.S.S.R. was about 150 million bushels. It is also expected that East European countries, under various agreements with Canada, will take about 20 million bushels to make up for reduction in supplies due to drought. As of July 31, 1968, there was a minimum of 18 million bushels and a maximum of 130 million bushels outstanding under the trade agreement with Mainland China. Many factors will affect the size of purchases, but total Canadian exports to Communist countries could be much higher than the 132 million bushels shipped in 1967-68.

In spite of the forecast for only a slight increase in world trade this year, Canada's exports could increase to 450 million bushels and possibly more. It is the objective of the Canadian Wheat Board to secure 25 per cent or more of world wheat trade. This will mean exports of 1,300 million bushels over the next three years. The increase in supplies of lower quality wheat from the 1968 harvest combined with

a large supply of high quality wheat from last year will provide a wider range of wheats for export and may enable larger sales to be made in particular markets. Also, with larger supplies of lower quality wheat, domestic utilization may be as high as last year when larger quantities of wheat were fed to livestock. The total supply for the current crop year is forecast at a record 1,295 million bushels. Exports and domestic consumption as anticipated may result in level of carryover stocks at July 31, 1969, in the region of 685 million bushels.

The wheat flour outlook is for a continued decline in production with reduced exports more than offsetting a slight increase in total domestic consumption. A large durum wheat crop in Canada and the United States and little increase in exports will likely hold durum prices at the low level of about \$2.00 per bushel that prevailed near the end of last season. It is anticipated that there will be a considerably increased supply of durum wheat carried over on farms into the 1969-70 season and this suggests that there will be a reduced acreage seeded to durum wheat next spring.

The general wheat outlook for 1968-69 is one of a continued build-up in wheat stocks because production will be slightly greater than domestic and export utilization. If exports reach the levels forecast, producers should be able to market more wheat than last year. However, no increase in acreage seeded in 1969 would seem to be necessary and a planted acreage somewhat lower than in 1968 would provide adequate supplies to meet anticipated needs in 1969-70.

RYE

Situation and Outlook

Total supply of spring and fall rye available for consumption during the 1967-68 season totaled 20 million bushels, a 26 per cent decrease from the previous year. Exports decreased 52 per cent in 1967-68 to 4.8 million bushels. Domestic utilization decreased 16 per cent to 8.0 million bushels. This was largely because less rye was fed to livestock. Stocks carried over into the 1968-69 crop year were 7.5 million bushels, down 9 per cent from the beginning stocks, but prices averaged lower than in the previous year.

As a result of an increase in the yield per acre offsetting reduced acreage seeded to rye, production in 1968 is estimated at 13 million bushels, an 8 per cent increase over the 12 million bushels produced last year. Should domestic utilization approach 9 million bushels this year, there will be some 12

million bushels of rye available for export and year-end carryover. If exports reach last year's 5 million bushels, carryover stocks at the end of 1968-69 should approach 7 million bushels, just under the opening stocks.

The United States rye supply for 1968-69 is placed at about 43.7 million bushels. This is down slightly from that of a year earlier and substantially below the 1966-67 level. United States domestic utilization of rye approximately equaled the 25 million bushel level of the past three years. During the 1967-68 crop year, rye exports totaled 3 million bushels and were down from the level of the two previous crop years.

Canadian exports of rye are affected greatly by production and supplies in Western and Eastern Europe. Should demand for Canadian rye in 1968-69 reach the level forecast, supplies will be adequate to meet this demand.

FEED GRAINS

Situation 1967-68

World production of feed grains (excluding Mainland China) is provisionally estimated at 470 million metric tons in 1967-68, slightly above the previous year's record. With the exception of oats, all feed grains participated in this rise. Crops were very good in most regions of the Northern Hemisphere, whereas output in major producing countries of the Southern Hemisphere was affected by drought. Developing countries produced more, but most of the increase occurred in the developed countries, especially the United States and Western Europe. In the U.S.S.R. and Eastern Europe, production did not reach the exceptionally high levels achieved in 1966-67.

International trade in feed grains in 1967-68 was slightly below the record 43 million tons reached in 1966-67. In spite of excellent domestic feed grain crops in Western Europe, exports to that area increased slightly, as did exports to Japan. Exports to developing countries were down but trade to Communist countries was steady. Corn prices fell sharply in 1967-68, but other feed grain prices fell only slightly. In spite of a weaker demand for feed grains generally, the volume of international trade in corn was close to the 1966-67 level. Trade in other feed grains was smaller, reflecting changes in the feed grain price relationships favoring corn. Due to a larger supply of corn in the United States, carryover stocks of feed grains were higher at the end of the 1967-68 season.

Canadian supplies of feed grains were down slightly in 1967-68 as increased beginning carryover stocks and imports from the United States did not quite offset a reduction in Canadian production. Domestic consumption of feed grains remained close to the 1966-67 level, but exports of both oats and barley fell slightly. Ontario corn prices fell relatively more than the prices for western feed oats and barley and therefore corn continued, in increased quantities, to replace other grains in livestock rations. In addition, oats is being replaced more rapidly than barley or mixed grains in eastern Canada, and feed barley, to a lesser degree, is replacing other feed grains in western Canada. These patterns reflect the relative price advantage of corn and barley over other grains in terms of feeding value.

Outlook 1968-69

Early indications point to a world feed grain crop in 1968-69 at least as large as last year, as a result of a larger than expected harvest of feed grains in the United States. In view of ample supplies and declining prices for corn, the United States Government restored acreage diversion incentives under the Feed Grain Program, but increased yields of all feed grain crops in the United States appear likely to offset any reduction in acreage which may have resulted from such diversions. Satisfactory production in most importing countries will have the impact of depressing, for the second consecutive year, import demand for feed grains with resulting downward pressures on prices and slower world trade. It is expected that world prices for feed grains in 1968-69 will be as low as or lower than in 1967-68.

Little change over the previous year is expected in the consumption of all feed grains by livestock in Canada. Larger feed grain production in Canada will be faced with low prices elsewhere, especially in the U.S., and Canadian prices can be expected to be lower in 1968-69 than in 1967-68. Corn will continue to be relatively cheaper than other feed grains and consumption of corn can be expected to increase, mainly in eastern Canada, at the expense of other feed grains, although increased consumption of barley can be expected in western Canada.

OATS

Situation and Outlook

Total domestic supplies in 1967-68 at 414 million bushels were 18 per cent less than the 502 million of the previous year. Primary marketings of this grain

from farms in the Prairie Provinces amounted to 31 million bushels in 1967-68 compared with the previous year's total of 38 million bushels. Shipments of oats under the Canadian Livestock Feed Board assistance program, according to preliminary data, amounted to 32 million bushels compared with the 1966-67 total of 39 million.

With the lower supplies available, total domestic utilization of oats declined to 333 million bushels. Exports of oats and oat products during 1967-68 decreased to 3.5 million bushels from 4.8 million of the previous year and the five-year average of 15.7 million bushels. With total disappearance exceeding the 1967 harvest, carryover stocks at July 31, 1968, declined to 77 million bushels in contrast to the 1967 total of 110 million. The Canadian Wheat Board asking price for oats, basis No. 1 feed in store at the Lakehead, opened the year at 91 cents per bushel and remained relatively constant to close the crop year at the same level.

The acreage seeded to oats for grain recorded an increase in 1968 and with yield increasing above the 1967 level, the current harvest is placed, on September 15, at some 358 million bushels, above the 1967 harvest of 304 million bushels but below the recent five year average of 394 million. When the current production is added to the carryover of 77 million bushels, total supplies of oats for the 1968-69 crop year amount to 435 million bushels.

The increased supply of oats in 1968-69 would seem to suggest increased domestic consumption of oats for feeding purposes. However, if recent price relationships between feed grains continue, the level of oat consumption for livestock feed may decline, as will the movement of oats for sale, either to other farms, to local feed mills, or to eastern Canada under the Canadian Livestock Feed Board assistance program. While there will be considerable consumption of oats on Canadian farms where oats are grown and fed on the same farm, the trend to replacement of oats in livestock rations with barley and corn will continue. In view of the feeding values of oats and the price relationships between feed grains, the general decline in acreage of oats should continue.

BARLEY

Situation and Outlook

Supplies of barley in 1967-68, at 380 million bushels, were 5 per cent less than the record of 399 million of the previous year. Due to a plentiful supply of barley, domestic utilization of this grain amounted to 208 million bushels in 1967-68, with a

large volume of barley going into livestock feed. Exports of barley, including malt, recorded a sharp decrease from 59 million bushels in 1966-67 to 41 million in 1967-68, due to an increased movement of subsidized French barley to some markets. With total disappearance about equal to the 1967 production, year end stocks at July 31, 1968, remained at about the same level 131 million bushels as the previous year. Shipment of barley under the Canadian Livestock Feed Board assistance program, according to preliminary data, amounted to 33 million bushels compared with 36 million the previous year. The Canadian Wheat Board asking quotation, basis No. 1 Feed, in store at the Lakehead, opened the 1967-68 crop year at \$1.28 $\frac{7}{8}$ per bushel and declined gradually throughout the year, averaging \$1.15 per bushel in July, 1968.

Reflecting an increase in the average yield per acre and an increase in acreage seeded to barley, production in 1968 is estimated at 316 million bushels in contrast to the 1967 production of 249 million bushels. Production in the Prairie Provinces, where the bulk of this crop is produced, is estimated at 292 million bushels as against 230 million in 1967. When the current crop is added to the opening stocks of 131 million bushels, total supplies for the current crop year at 447 million bushels, will be 17 per cent greater than the 1967-68 total of 381 million bushels.

With the large supply of other feed grains on both the world and domestic markets, barley prices are expected to continue at lower levels. Domestic utilization of barley could increase to some 220 million bushels in 1968-69 and exports seem likely to continue at about the recent average of some 35 million bushels. This would result in a July 31, 1969 carryover of 192 million bushels. With the continued trend to more barley feeding, there appears to be no case for a change in acreage in 1969.

GRAIN CORN

Situation and Outlook

The production of Canadian grain corn rose by a further 12 per cent in 1967-68, due to both increased acreage and improved yields. Imports of United States corn were up from the previous year. Corn supplies reached 112 million bushels, up 18 per cent from the previous year's supplies. The quantity of grain used for human food, industrial purposes and seed, was little changed from the previous year, but livestock consumption of corn increased by about 18 million bushels to a total of 86 million bushels. Of

this latter figure, one million bushels was Ontario corn moved to the Maritimes under the Canadian Livestock Feed Board assistance program.

The increase in United States corn imports was due almost solely to an improved competitive position for United States corn in the Canadian market caused by a greater average reduction in corn prices in the United States compared with the average reduction in Canadian corn prices and Canadian feed grain prices generally. For example, the average price for No. 3 Yellow corn at Chicago in 1967-68 at U.S. \$1.12 per bushel was 18 per cent lower than the previous year, while the average price for No. 2 Yellow corn at Chatham at \$1.31 per bushel, was 14 per cent lower than in 1966-67. In addition, the reduction in prices in 1967-68 from the previous year for other Canadian feed grains in store at the Lake-head averaged 6 per cent.

United States production in 1967-68 increased to 4,722 million bushels, with an increase in both harvested acreage and average yield. Supplies were up from 4,958 million bushels to 5,546 million bushels.

Although yields are reported to be slightly lower, Canadian corn acreage is up again in 1968, and production at September 15 was forecast to be slightly higher at 78.1 million bushels. Beginning commercial carryover stocks (excluding farm stocks) were down slightly to 4.4 million bushels. If the selling prices for all feed grains maintain their present levels, imports of U.S. corn will be as large or even larger than last year. Hence supplies of corn in Canada could be around 114 million bushels.

With larger corn supplies in the U.S., the general outlook for corn prices is a continuation of the low level experienced in 1967-68, at or below the average loan level of U.S. \$1.05 per bushel. Such a price situation will be due not so much to a large over-supply of corn, as was the case last year, but rather to an increase in U.S. production of oats, barley and grain sorghum which will push total supplies of feed grains in the U.S. to a recent record level. Canadian corn prices, especially in South-Western Ontario, are expected to remain low throughout the season in line with the landed price of United States corn in competing market centres. However, corn prices in Eastern Ontario and Quebec will average higher, reflecting the higher costs of shipment of U.S. corn to these latter areas.

While these low Canadian prices may slow up the continued increases in corn production in South-Western Ontario, there will likely be larger increases in Eastern Ontario and Quebec.

LONGER TERM OUTLOOK FOR GRAINS

There are varying assessments of the demand for wheat and feed grains and the level of world trade in grains between now and 1980, but assuming continuance of present consumption and production trends, the most likely development will be re-establishment of the balance between supply and demand. Within this balance, there may be temporary surpluses in some years or depletion of stocks below normal levels, coinciding with unfavorable crop conditions in other years. Demand for wheat in Western European countries may continue to shrink, and demand for feed grains may continue to increase but at a slower rate. The U.S.S.R. and Eastern Europe are unlikely to purchase the very large quantities of wheat of recent years, and trade in feed grains with these countries will be limited. Mainland China is expected to continue to be a major importer of all grains and likewise Japanese demand for both wheat and feed grains is likely to be a sustaining force on the world markets. The overall prospects for grain exports to developing countries will continue to be largely dependent on food aid financing although some of the developing countries could increase the level of their commercial purchases. Total exports of Canadian wheat between now and 1980 may be difficult to maintain at recent high levels as a consequence of probable reduced trade with Communist countries. Canadian participation in the increasing world market for feed grains will likely continue to be limited as long as the world trading prices for higher energy grains, especially United States corn, enjoy relative price advantages over Canadian feed grains in terms of feeding value. The volume of production of Canadian feed grains will need to increase further to 1980 as livestock consumption continues to rise in Canada. While total grain production will need to increase the emphasis will need to move slowly toward feed grains.

OILSEEDS

World Oilseed Situation and Outlook

The world supply of oils and fats in 1968 is expected to establish record levels for the tenth consecutive year reaching a total of approximately 41 million short tons. Animal fat and marine oil production is expected to reach record levels in 1968. Coupled with this, there will also be a pronounced increase in production of edible vegetable oils. World production of linseed oil is likely to continue its downward trend.

World production is expected to be at or near record levels for the three oilseed crops grown in Canada. Soybean production will be up sharply, because of an anticipated 10 per cent increase in United States production, to a new high of 1,080 million bushels in 1968. Sunflower production will approximate last year's record level of 700 million bushels. Rapeseed production is likely to equal last year's output of 240 million bushels, with production increases in countries of the European Economic Community offsetting decreases in Canada and Poland. Cottonseed, peanut, and olive oil production are all likely to be higher than last year.

The current year has been marked by sharp declines in world prices of most edible oils. Prices in Rotterdam in late August 1968 for soybean oil and rapeseed oil were down 25 per cent from prices in August 1967; prices for sunflower oil were down 23 per cent, a recovery from July 1968 prices which had been 29 per cent below last August's prices. Many other vegetable oils showed decreases in prices in varying degrees. The price of linseed oil on the other hand, was about 8 per cent higher than a year ago, and soybean meal prices, with rising demand for protein feeds in many western European countries, increased by 5 per cent during the period. The competitive position for Canadian edible oilseeds at home as well as abroad is being adversely affected by general world surplus production spurred by support programs in other countries.

Technical developments in the use of vegetable oils and meal have significantly increased their interchangeability and narrowed the spread in the market value of the respective oilseeds.

FLAXSEED

Situation

Flaxseed exports for the crop year 1967-68 were 12.6 million bushels, almost 24 per cent less than the 1966-67 exports of 16.6 million bushels, continuing the downward trend of past years. Japan continues to be Canada's largest customer, taking nearly one third of total exports, followed by Britain and the Netherlands. Britain continued to import Canadian oilcake and meal although in lower quantities than last crop year. Conversely, sales to Britain of linseed oil in the first 7 months of 1968, at 15 million pounds, were nearly double imports from Canada in the 1967 calendar year. Crushings of flaxseed in the crop year 1967-68 amounted to 129 million pounds, a decrease of 10 per cent from 143 million pounds crushed in the previous crop year.

The average price in 1967-68 for No. 1 C.W. flaxseed, basis the Lakehead, was \$3.45 per bushel, well above the average price of \$3.00 for the previous two years. Flaxseed stocks were down sharply at the end of the 1967-68 crop year to 4.8 million bushels from the previous year's figure of almost 12 million bushels.

Production of flaxseed in Canada was up sharply in 1968 with forecasts indicating a crop of 17.3 million bushels, almost double that of the previous year although lower by 22 per cent from 1966-67. Yields at 11.3 bushels per acre are slightly above average, and acreage was up by nearly 50 per cent from last year. Acreage in Manitoba increased in 1968 to 820,000 acres, 25 per cent more than 1967 acreage, although well below the acreages of 1966 or 1965. Acreage in Saskatchewan in 1968 was 397,000 compared with 193,000 in 1967. In the late 1950's, Saskatchewan's acreage averaged 1,400,000 acres and was higher than the other two provinces combined but decreased steadily in the early 1960's. Alberta's acreage in 1968 at 285,000 acres was nearly double the 1967 acreage but well below acreages of earlier years. Production in 1968 for Manitoba is forecast to be 8.5 million bushels; for Saskatchewan, 4.1 million bushels and for Alberta, 4.3 million bushels. With lower carryover than last year, total available supply will be higher by about .8 million bushels in 1968.

Outlook

The United States crop in 1968 is 26.4 million bushels, 6.5 million bushels more than in 1967. The Argentine crop is likely to be at least 3 per cent more than last year. Canada and the United States both have higher total supply than last year, but the Argentine total supply was down by 25 per cent in 1967 and total supply after this year's crop will likely still be at a relatively low level. However, the usage of linseed oil is still declining and unless usage increases there is a possibility of oversupply in relation to the falling demand.

Prices in September had already decreased to \$3.30 per bushel, basis Lakehead, since the crop forecast of September 2 and with revised estimates of the United States crop. Prices are not likely to regain levels attained earlier this year if final production figures are in line with current forecasts, although it does not appear likely that any substantial oversupply will occur. Prices for 1968-69 at levels of \$3.00 per bushel or more (Lakehead) remain a distinct possibility. However, with a declining demand for oil an increase in acreage another year

might well result in over supply with consequent sharp price decreases.

RAPESEED

Situation

Exports of rapeseed in 1967-68 amounted to 12.3 million bushels, down by 11 per cent from the 1966-67 figure of 13.8 million bushels but 50 per cent higher than the average for the preceding 5 year period. Over 80 per cent of recent exports are going to Japan with almost all of the balance to Taiwan. Since July 1967, exports to Italy and other European Economic Community countries have almost ceased. Canada is still the world's largest exporter of rapeseed but in terms of production among main exporters, Canada may this year rank third to Poland and France. In previous years Canada ranked second to Poland. Domestic rapeseed crushings increased from 4.96 million bushels in the 1966-67 crop year to 5.14 million in 1967-68. Average crop year prices fell sharply from \$2.78 per bushel (basis no. 1 Canada rapeseed in store Vancouver) in 1966-67 to \$2.27 in 1967-68. Rapeseed crude oil prices (basis price per pound f.o.b. Western Canadian plant) fell from 10 cents per pound in August 1967 to 8.2 cents per pound in August 1968, and rapeseed meal prices fell from \$68.13 per ton in August 1967 to \$60.00 in August 1968.

Carryover in Canada at the beginning of this crop year was 40 per cent more than last year, at a new high of 8.3 million bushels.

The 1968 rapeseed crop is forecast at 17.5 million bushels compared with 24.7 million bushels last year. The increased yield from 15.2 to 16.6 bushels per acre offsets to some extent the effect of the decreased acreage. Acreage was down in all three provinces in 1968 compared with 1967; in Alberta, from 875,000 to 450,000 acres; in Saskatchewan, from 600,000 to 511,000; and in Manitoba, from 145,000 to 91,000 acres.

With large carryover offset by the decrease in production the Canadian supply position for the current year is expected to be 26 million bushels, down only 4.7 million bushels from last year.

Outlook

In the past crop year Canada has not been able to market rapeseed in the E.E.C. countries because of the support prices and subsidies applied to production in the E.E.C. Unless there is a change in E.E.C. policies, Canada will not be able to re-enter this

market in the foreseeable future. Exports to Japan and Taiwan have been increasing steadily and this trend should continue. Rapeseed prices have risen above the low point of mid-summer but the over-supply on the world market of fats and oils seems to preclude the possibility of any substantial increase in prices during the coming year.

On the domestic market, rapeseed crushing is moving ahead, but it appears that the domestic potential for rapeseed oil and meal is not fully exploited. In spite of the substantial world supplies of fats and oils, with resulting low prices, it is expected that the continuance of this year's production levels in Canada would not depress prices for Canadian rapeseed.

SOYBEANS

Situation

Imports of soybeans for the crop year 1967-68 decreased to 13.3 million bushels from 16.3 million bushels in 1966-67. Imports of soybean oil, on the other hand, increased in 1967-68 to 20.9 million pounds from 20 million pounds in 1966-67. Soybean meal imports rose from 228 thousand tons in 1966-67 to 237 thousand tons in 1967-68. Exports of soybeans in 1966-67 were 3.6 million bushels; in 1967-68 exports of soybeans fell to less than 1.6 million bushels. This compares with the 1961-65 average of 2.6 million bushels. Exports of soybean meal fell slightly, from about 170,000 tons to 169,000 tons. Exports of soybean oil were down from 34.6 million pounds to 30.3 million pounds. Soybean crushings were virtually unchanged this crop year at 1,189 million pounds. The price for soybeans, no. 2 or better, basis f.o.b. Chatham, Ontario, for the crop year 1967-68 was \$2.78 compared to \$3.06 the previous year. Prices for soybean crude oil, delivered at factory, Eastern Canada, fell from 12.38 cents per pound in August 1967 to 9.30 cents per pound in August 1968. Prices for meal (44 per cent protein) increased from \$93.50 to \$100.50 per ton over the same period. Canadian soybean production in the current crop year is forecast at 9.1 million bushels, grown on 295,000 acres as compared with last year's crop of 8.1 million bushels, grown on 290,000 acres.

Outlook

Canadian exports of soybeans to Britain are expected to decline still further in 1968-69. One factor affecting this market is the removal, as of July 1,

1968 by Britain, of the 5 per cent tariff on soybeans imposed on countries not under British preference.

A record soybean crop of 1,080 million bushels is expected in the United States. Carryover in the United States was 36 million bushels in 1966 and 90 million bushels in 1967. Carryover in the current year is expected to rise to 155 million bushels and the possibility exists that next year a further increase to 250 million bushels may occur. With United States farmers producing more beans that can be sold, prices may well sag below the support level this fall until excess stocks are locked up under price support. These low prices would lead to low prices in Canada for a period this fall as well. Although prices in 1969 may not be much different than in 1968, there is still a large domestic market for soybean oil and meal in Canada.

SUNFLOWER SEED

Situation

Sunflower seed acreage in 1968 was 40,000 acres compared with 46,000 acres in 1967. This acreage is almost completely confined to Manitoba. Production is expected to be below average although data on actual yields are not yet available. Weather problems this year have reduced the anticipated yield. About one third of the crop will be used for bird seed and confection and the rest crushed for oil. The Canadian export market for sunflower seed, almost all of which

goes to the United States for bird seed, decreased from about 13.5 million pounds in 1966-67 to about 3.4 million pounds in 1967-68.

The 50 per cent increase in world sunflower production in the last 5 years originating largely in Eastern Europe and Russia, has resulted in large quantities being available for export on world markets. Prices on the world market fell to such an extent that there were imports of sunflower seed oil, originating in eastern Europe, into Canada. In the 1967 calendar year these imports amounted to over 34 million pounds; for the first 6 months of 1968 imports amounted to 18 million pounds compared with 11 million for the corresponding period in 1967.

In the United States sunflower seed production has been rising, particularly in North Dakota and Minnesota, but, as in Canada, acreage expansion in 1968 was curtailed by low prices. Experimental work is being carried out in a number of southern states including Texas.

Outlook

Low world prices for sunflower oil will likely continue for some time to come although perhaps not at the extremely low levels prevailing this spring and summer. This will depend on the export policies of some major producing countries. Low yields this year may also be a factor against acreage expansion in Canada during 1969; but the potential market for sunflower seed oil remains good.

TABLE 1—WHEAT AND WHEAT FLOUR^a, WORLD PRODUCTION, TRADE AND CARRYOVER

Item	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67 (Revised)	1967-68 (Preliminary)	1968-69 (Forecast)
million bushels					
Production.....	8,562	9,233	10,400	10,200	10,000
Trade.....	1,349	1,918	2,050	1,950	1,950
Year end carryover ^b	2,028	1,655	1,330	1,565	1,700
million metric tons					
Production.....	233.0	251.3	283.0	277.6	272.2
Trade.....	36.7	52.2	55.8	53.1	53.1
Year end carryover ^b	55.2	45.0	36.2	42.6	46.3

^a Flour in terms of wheat equivalent.

^b For 8 exporting countries: As at May 31, Spain; June 30, USA and Italy; July 31, Canada and France; August 30, Sweden; November 30, Argentina and Australia.

TABLE 2—CANADIAN EXPORTS OF WHEAT^a, AND WHEAT FLOUR^b, BY IMPORTING SECTOR

Importing Sector	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67 (Revised)	1967-68 (Preliminary)	1968-69 (Forecast)
million bushels					
Developed countries ^c	231.1	210.3	206.1	159.0	
Developing countries ^d	42.2	43.5	73.9	43.1	
Communist countries ^e	22.9	197.2	234.6	132.7	
Total.....	297.2	451.1	514.6	334.8	
million metric tons					
Developed countries ^c	6.32	5.72	5.61	4.33	
Developing countries ^d	1.15	1.19	2.01	1.17	
Communist countries ^e.....	.62	5.37	6.38	3.61	
Total.....	8.09	12.28	14.00	9.11	
per cent					
Canadian Share of Total World Wheat Trade.....	22.0	23.5	25.1	17.2	

^a Excludes bagged seed wheat which totaled .8 million bushels in 1965-66; .7 in 1966-67; and .8 in 1967-68.

^b Flour in terms of wheat equivalent.

^c Western Europe, Yugoslavia, South Africa, Japan, Australia, New Zealand, and Continental United States.

^d All countries not specified in (c) or (e).

^e Eastern Europe, U.S.S.R., Cuba, Peoples Republic of China, North Korea, and North Vietnam.

TABLE 3—ACREAGE, YIELD, SUPPLY, UTILIZATION AND PRICE, GRAIN, CANADA^a
(CROP YEAR, AUGUST 1 TO JULY 31)

Item	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67 (Revised)	1967-68 (Preliminary)	1968-69 (Forecast)
WHEAT					
Acreage (thousand acres).....	23,106	27,540	29,692	30,121	29,422
Yield (bushels per acre).....	20.1 ^b	20.5 ^b	27.9	19.7	21.3
million bushels					
Stock at August 1.....	629.8	491.8	420.1	576.8	667.5
Production.....	465.5	564.5	827.3	592.9	672.9
Imports.....	"	"	"	"	"
Total supply.....	1,095.3	1,056.4	1,247.5	1,169.7 ^d	1,295.4 ^d
Exports.....	302.0	453.7	515.3	335.6	
Domestic.....	157.8	148.5	155.4	166.5	
Stock at July 31.....	635.6	454.2	576.8	667.5	
Farm price (dollars per bushel) ^e	1.35	1.68	1.76		
RYE					
Acreage (thousand acres).....	540	679	726	685	679
Yield (bushels per acre).....	16.0 ^b	18.4 ^b	23.7	17.5	19.5
million bushels					
Stocks at August 1.....	10.8	6.2	10.6	8.3	7.5
Production.....	8.6	12.5	17.2	12.0	13.2
Imports.....	"	0.1	"	"	"
Total supply.....	19.5	18.8	27.8	20.3 ^d	20.7 ^d
Exports.....	4.2	6.0	10.0	4.8	
Domestic.....	6.1	6.0	9.5	8.0	
Stocks at July 31.....	9.2	6.8	8.3	7.5	
Farm price (dollars per bushel) ^e.....	.90	1.08	1.09		
OATS FOR GRAIN					
Acreage (thousand acres).....	9,449	8,959	7,924	7,436	7,766
Yield (bushels per acre).....	39.6 ^b	44.0 ^b	47.3	40.9	46.1
million bushels					
Stocks at August 1.....	143.6	130.8	127.2	109.8	77.0
Production.....	374.6	393.9	374.7	304.2	357.6
Imports.....	"	1.1	"	"	"
Total supply.....	518.2	525.8	501.8	414.0 ^d	434.6 ^d
Exports.....	12.2	15.1	4.8	3.5	
Domestic.....	363.1	377.5	387.3	333.4	
Stocks at July 31.....	142.8	133.2	109.8	77.0	
Farm price (dollars per bushel) ^e	0.64	0.69	0.74		

TABLE 3—ACREAGE, YIELD, SUPPLY, UTILIZATION AND PRICE, GRAIN, CANADA^a
(CROP YEAR, AUGUST 1 TO JULY 31) (Continued)

Item	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67 (Revised)	1967-68 (Preliminary)	1968-69 (Forecast)
BARLEY					
Acreage (thousand acres).....	8,365 ^b	5,722 ^b	7,461	8,115	8,836
Yield (bushels per acre).....	27.1	31.0	40.4	30.6	35.8
			million bushels		
Stocks at August 1.....	126.3	93.3	97.8	131.8	130.6
Production.....	226.4	177.3	301.2	248.7	316.2
Imports.....	*	0.1	0.1		
Total supply.....	352.7	270.7	399.1	380.4 ^d	446.8 ^d
Exports.....	68.6	36.1	58.5	41.4	
Domestic.....	157.4	144.2	208.8	208.4	
Stocks at July 31.....	126.6	90.4	131.8	130.6	
Farm price (dollars per bushel) ^e	0.77	0.99	1.05		
CORN FOR GRAIN					
Acreage (thousand acres).....	491	559	807	876	956
Yield (bushels per acre).....	58.7 ^b	75.6 ^b	82.2	84.6	81.7
			million bushels		
Stocks at August 1 ^f	1.5	5.4	5.8	5.9	4.4
Production.....	28.8	42.2	66.3	74.1	78.1 ^d
Imports.....	13.8	25.2	22.9	31.7	
Total supply.....	44.1	72.8	94.9	111.7	
Exports.....	0.4	0.2	0.3	0.3	
Domestic.....	41.6	66.7	88.8	107.0	
Stocks at July 31 ^f	2.1	6.0	5.9	4.4	
Farm price (dollars per bushel) ^e	1.20	1.29	1.47		
MIXED GRAINS					
Acreage (thousand acres).....	1,446	1,546	1,767	1,668	1,667
Yield (bushels per acre).....	43.5 ^b	46.1 ^b	46.1	45.8	50.2
Production (million bushels).....	63.0	71.2	81.4	76.4	83.6
Farm price (dollars per bushel) ^e	0.81	0.87	0.93		

^a Includes grain products in terms of grain.

^b Weighted average yield.

^c Less than 50,000 bushels.

^d Excluding imports, as of September 15, 1968.

^e Average price received by farmers for all grades and varieties.

^f Commercial only; includes U.S. and other foreign corn.

TABLE 4—ACREAGE, YIELD, PRODUCTION AND PRICE, TAME HAY^a, CANADA (CROP YEAR, AUGUST 1 TO JULY 31)

Item	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67 (Revised)	1967-68 (Preliminary)	1968-69 (Forecast)
TAME HAY^a					
Acreage (thousand acres).....	11,544	12,522	13,154	12,902	12,438
Yield (tons per acre).....	1.71 ^b	1.75 ^b	1.98	1.97	1.84
Production (thousand tons).....	19,694	21,957	26,049	25,385	22,913
Farm Price ^b (dollars per ton).....	15.26	17.48	18.02		

^a Including clover and alfalfa.

^b Average price.

TABLE 5—SUPPLY, UTILIZATION AND PRICE, MILLFEEDS^a, CANADA, (CROP YEAR, AUGUST 1 TO JULY 31)

	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67 (Revised)	1967-68 (Preliminary)
	tons			
MILLFEEDS				
Stocks at August 1.....	9,113	6,899	6,621	4,420
Production.....	669,180	681,911	667,140	639,247
Total supply.....	678,293	688,810	673,761	643,667
Exports.....	79,447	100,066	101,817	52,485
Domestic.....	591,008	581,731	567,524	585,189
Stocks at July 31.....	7,838	7,013	4,420	5,993
	dollars per ton			
Price of bran at Toronto ^b	54.38	64.83	69.38	60.54 ^a
Price of shorts at Toronto ^b	58.08	68.37	71.79	64.13 ^a

^a Bran, Shorts and Middlings.

^b Average of mid-month quotations for carlots, f.o.b. Toronto: freight assistance payments deducted.

^c As of April 1968 prices quoted are to a more representative customer and are not comparable to those reported prior to that date.

TABLE 6—SHIPMENT UNDER CANADIAN LIVESTOCK FEED BOARD ASSISTANCE PROGRAM INTO EASTERN CANADA AND BRITISH COLUMBIA, (CROP YEAR, AUGUST 1 TO JULY 31)

Item	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67 ^a (Revised)	1967-68 ^a (Preliminary)
	thousand bushels			
Wheat.....	20,638	13,753	16,969	10,947
Oats.....	36,582	31,307	39,915	34,659
Barley.....	29,698	28,003	35,776	35,278
Rye.....	36	224	1,103	1,170
Corn.....	76	32	31	1,184 ^b
Totals.....	87,031	73,318	93,794	83,238
	thousand tons			
Totals, 5 grains.....	1,957	1,624	2,078	1,831
Screenings.....	91	95	127	72
Millfeeds.....	503	524	518	501
Totals.....	2,610	2,242	2,723	2,404

^a Based on claims filed up to August 31, 1968.

^b Includes Ontario corn.

TABLE 7—FEED CONCENTRATE BALANCE, NUMBERS OF ANIMAL UNITS AND FEED PER UNIT, CANADA, (CROP YEAR, AUGUST 1 TO JULY 31)

Item	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67 (Revised)	1967-68 (Preliminary)	1968-69 (Forecast)
Supply	million tons				
Stock beginning crop year ^a	5.5	4.6	4.7	5.2	4.6
Production of feed grains:					
corn.....	0.8	1.2	1.9	2.1	2.2
oats.....	6.4	6.7	6.4	5.2	6.1
barley.....	5.4	4.2	7.2	6.0	7.6
mixed grain and buckwheat.....	1.3	1.5	1.7	1.6	1.7
Totals, production.....	13.9	13.6	17.1	14.8	17.6
Imports of feed grains.....	0.4	0.7	0.6	0.9	0.9
Wheat and rye fed.....	2.1	1.5	1.8	2.1	2.0
By-product feeds fed.....	1.3	1.5	1.6	1.7	1.7
Totals, supply.....	23.2	21.9	25.8	24.6	26.8
Utilization					
Concentrates fed ^c :					
corn.....	0.8	1.4	1.9	2.4	2.5
oats.....	5.6	5.9	6.2	5.2	5.4
barley.....	3.4	2.8	4.3	4.2	4.5
mixed grain and buckwheat.....	1.2	1.4	1.6	1.5	1.6
wheat and rye.....	2.2	1.5	1.8	2.1	2.0
oilseed cake and meal.....	0.4	0.5	0.6	0.7	0.7
animal protein feeds.....	0.2	0.2	0.3	0.3	0.3
other by-product feeds.....	0.7	0.7	0.8	0.8	0.8
Totals, concentrates fed.....	14.3	14.5	17.4	17.1	17.8
Feed grains for seed, human food and industry.....	1.6	1.7	1.8	1.9	1.9
Exports.....	1.9	1.1	1.5	1.1	0.9
Totals, utilization.....	17.7	17.3	20.6	20.1	20.6
Stock at end of crop year ^b	5.5	4.6	5.2	4.6	6.2
Supply and utilization per animal unit					
Total supply (million tons).....	23.2	21.9	25.8	24.6	26.7
Concentrates fed (million tons).....	14.3	14.5	17.4	17.1	17.8
Grain-consuming animal units, June 1 (million).....	15.7	16.0	16.6	17.3	16.7
Supply per animal unit (tons).....	1.48	1.37	1.55	1.42	1.60
Concentrates fed per animal unit (tons).....	.91	.91	1.05	.99	1.07

^a Preliminary estimates based on production as of September 15 and forecasts of utilization and exports.

^b Total stocks of oats and barley and commercial stocks of corn only.

^c Total quantities fed in Canada, including domestically produced and imported grains and by-product feeds.

Note: Due to rounding the sums of individual items may not agree exactly with the totals.

TABLE 8—MONTHLY AND YEARLY AVERAGE PRICES, GRAINS (CROP YEAR, AUGUST 1 TO JULY 31)

Month	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67	1967-68	1968-69	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67	1967-68	1968-69
cents per bushel										
Wheat No. 1 Northern ^a						Feed Wheat ^a				
August.....	166	194	211	204	200	133	171	187	186	180
September.....	166	195	212	193		134	172	189	177	
October.....	165	196	211	194		134	173	190	178	
November.....	165	197	212	190		135	175	191	174	
December.....	165	197	213	191		136	175	192	175	
January.....	166	198	212	192		138	175	191	176	
February.....	168	198	212	192		138	175	191	176	
March.....	167	198	213	194		138	175	192	178	
April.....	166	198	213	194		137	175	192	178	
May.....	166	199	213	193		136	175	192	177	
June.....	166	200	211	197		136	176	190	179	
July.....	168	200	206	199		138	177	188	179	
Yearly Average.....	166	198	212	194		136	174	190	178	

TABLE 8—MONTHLY AND YEARLY AVERAGE PRICES, GRAINS (CROP YEAR, AUGUST 1 TO JULY 31) (Continued)

Month	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67	1967-68	1968-69	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67	1967-68	1968-69
cents per bushel										
No. 1 C.W. Amber Durum ^a						No. 2 C.W. Rye ^a				
August.....	205	247	225	232	206	112	128	134	131	116
September.....	203	243	226	232		113	134	131	126	
October.....	198	245	227	226		113	137	126	126	
November.....	195	246	228	222		112	134	128	126	
December.....	196	244	229	223		107	137	132	126	
January.....	197	245	228	214		108	140	130	130	
February.....	198	244	228	205		108	139	133	135	
March.....	197	241	228	202		108	136	137	138	
April.....	197	240	224	201		108	136	137	132	
May.....	198	241	224	200		107	134	137	128	
June.....	200	241	222	206		108	134	135	121	
July.....	212	243	222	206		112	130	138	119	
Yearly Average.....	200	243	226	214		110	135	133	128	
No. 1 Feed Oats ^a						No. 1 Feed Barley ^a				
August.....	74	82	90	91	87	97	119	134	128	111
September.....	74	82	90	92		97	122	133	125	
October.....	74	81	90	91		99	123	133	123	
November.....	73	80	90	92		96	122	133	123	
December.....	71	81	90	92		96	123	133	123	
January.....	72	82	87	92		96	125	128	123	
February.....	72	82	87	92		96	125	124	123	
March.....	71	82	87	92		95	124	123	123	
April.....	70	82	87	92		94	124	124	124	
May.....	71	82	87	92		94	124	124	118	
June.....	72	81	88	91		94	122	126	115	
July.....	75	83	89	91		99	122	127	115	
Yearly Average.....	72	82	88	92		96	123	128	122	
Corn No. 2 Yellow ^b , Chatham						Corn No. 3 Yellow ^c , Chicago				
August.....	135	145	153	149	131	133	121	148	119	105
September.....	136	144	157	149		128	122	144	116	
October.....	118	129	146	133		116	115	137	114	
November.....	114	126	148	125		114	113	131	107	
December.....	117	132	153	126		116	117	142	111	
January.....	120	136	154	128		117	121	139	109	
February.....	121	136	154	130		117	121	137	111	
March.....	122	138	153	127		118	122	137	114	
April.....	124	139	154	126		123	123	134	113	
May.....	125	142	154	124		125	126	136	115	
June.....	126	147	154	126		126	127	134	112	
July.....	127	147	155	130		125	128	128	109	
Yearly Average.....	124	138	153	131		122	121	137	112	

^a Canadian Wheat Board Prices, basis in store Fort William-Port Arthur.^b Buying prices, carlots, f.o.b. Chatham, 15 per cent moisture (natural or kiln dried).^c New crop corn.^d Closing cash market prices, basis f.o.b. track, Chicago; U.S. cents per bushel.

TABLE 9—OILSEEDS: ACREAGE, YIELD, SUPPLY, DISPOSITION AND PRICES, CANADA, 1956 TO 1968
(CROP YEAR AUGUST 1 TO JULY 31)

Item	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67	1967-68	1968-69 (Estimated)
FLAXSEED					
Harvested acreage (thousand acres).....	2,729	1,901	1,918	1,023	1,524
Yield (bushels per acre).....	8.5	10.6	11.5	9.2	11.3
thousand bushels					
Stocks at August 1.....	5,516	6,106	11,141	11,831	4,766
Production.....	23,260	20,228	22,020	9,378	17,171
Imports.....	47	15	2		
Total supply.....	28,825	26,349	33,163	21,209	22,037
Exports.....	15,121	14,295	16,568	12,611	
Domestic disappearance.....	7,269	5,235	4,764	3,832	
Stocks at July 31.....	6,432	6,818	11,831	4,766	
dollars per bushel					
Average farm price (all grades).....	2.70	2.99	2.72		
RAPESEED					
Harvested acreage (thousand acres).....	514	757	1,525	1,620	1,052
Yield (bushels per acre).....	14.4	16.2	16.9	15.2	16.6
thousand bushels					
Stocks at August 1.....	217	1,068	3,148	5,827	8,300
Production.....	7,420	12,254	25,800	24,700	17,459
Total supply.....	7,636	13,322	28,948	30,527	25,759
Exports.....	5,342	8,169	13,818	12,309	
Domestic disappearance.....	2,019	3,551	9,303	9,919	
Stocks at July 31.....	273	1,601	5,827	8,300	
dollars per bushel					
Average farm price (all grades).....	1.64	2.30	2.47		
SOYBEANS					
Harvested acreage (thousand acres).....	248	231	279	290	295
Yield (bushels per acre).....	24.4	28.7	32.3	27.9	31.0
thousand bushels					
Production.....	6,057	6,649	9,012	8,091	9,145
Imports.....	11,985	15,442	16,295	13,328	
Total supply.....	18,042	22,091	25,307	21,419	
Exports.....	2,049	2,612	3,599	1,571	
Domestic disappearance.....	15,993	19,479	21,708	19,848	
dollars per bushel					
Average farm price (all grades).....	1.98	2.62	3.00		
SUNFLOWER SEED					
Harvested acreage (thousand acres).....	39	49	53	46	40
Yield (bushels per acre).....	19.4	19.2	21	26	n.a.
Production (thousands of bushels).....	755	943	1,093	1,200	
dollars per bushel					
Average farm price.....	1.32	1.50	1.80		

LIVESTOCK, MEAT AND WOOL

CATTLE

Situation

Cattle Marketings—Cattle sold on public stockyard and shipped direct to packing plants in Canada, from January to August 1968, totaled 2,103,171 head (61,858 weekly), up 3.3 per cent from the total of 2,035,409 head (59,865 weekly) in 1967 (Table 1). Marketings in Western Canada were up 3.9 per cent with virtually all of the increase occurring in Alberta. In Eastern Canada, marketings were up 2.2 per cent with Ontario accounting for all of the increase.

Inspected slaughter (beef gradings) to the end of August 1968 totaled 1,777,152 head (52,269 weekly), an increase of 4.8 per cent from the total of 1,695,050 head (49,854 weekly) for the same period in 1967. Nearly all of the increase is accounted for by the ever increasing fed cattle slaughter. Combined Choice and Good carcasses constituted 58 per cent of total inspected slaughter to the end of August 1968, with an

average of 30,362 head per week, an increase of 5.3 per cent over the same period in 1967.

The make-up of the beef kill with respect to sex shows that to the end of August 1968, steer and heifer slaughter accounted for 49.8 and 23.3 per cent respectively of the total slaughterings, and cows and bulls combined, 26.9 per cent (Table 2). The increase in cow slaughter as indicated by gradings to the end of August 1968, was mainly in Western Canada. The explanation may be that owing to favorable range conditions for the past two years and the spread in price between steer and heifer calves for feeding, the producers have carried over heifer calves. As such animals are now going into herds as replacement females, there is a corresponding increase in the number of older cows going to slaughter. The increase in heifer slaughter to the end of August 1968, of 11.3 per cent (an average increase of 1237 head weekly), reflects the increasing numbers of heifers going through feedlots.

TABLE 1—CATTLE MARKETINGS ON PUBLIC STOCKYARDS AND DELIVERED DIRECT TO PACKING PLANTS

	January to August		Change in number	Per cent change
	1967	1968		
	number			
British Columbia.....	32,433	32,877	+ 444	+ 1.4
Alberta.....	741,976	817,488	+75,512	+10.2
Saskatchewan.....	386,043	372,546	-13,497	- 3.5
Manitoba.....	207,631	198,236	- 9,395	- 4.5
West.....	1,368,083	1,421,147	+53,064	+ 3.9
Quebec.....	58,849	58,489	- 360	- 0.6
Ontario.....	586,818	603,755	+16,937	+ 2.9
Maritimes.....	21,659	19,780	- 1,879	- 8.7
East.....	667,326	682,024	+14,698	+ 2.2
Canada.....	2,035,409	2,103,171	+67,762	+ 3.3

TABLE 2—SEX PATTERN: AVERAGE WEEKLY INSPECTED SLAUGHTER IN CANADA DURING THE PERIOD JANUARY TO AUGUST 1966 TO 1968

	1966		1967		1968		Per cent change from 1967 to 1968
	number	per cent	number	per cent	number	per cent	
Steers.....	24,746	48.5	26,086	52.3	26,040	49.8	- 0.2
Heifers.....	10,505	20.6	10,940	21.9	12,177	23.3	+11.3
Cows.....	14,673	28.8	11,857	23.8	13,055	25.0	+10.1
Bulls.....	1,065	2.1	971	2.0	997	1.9	+ 2.7
Total.....	50,989	100.0	49,854	100.0	52,269	100.0	+ 4.8

Domestic Disappearance—The domestic disappearance of beef from commercial supplies to the end of July 1968, averaged 52,500 head per week, compared to 51,500 head for the same seven months in 1967, an increase of 2 per cent.

Trade in Dressed Beef and Veal—Exports of beef and veal from Canada to the end of July 1968, were approximately 30.2 million pounds, compared with 17.9 million in 1967 and 46.3 million pounds for the same seven months of 1966. The increase in exports is largely due to the slaughter of a larger volume of cows producing carcasses in the manufacturing grade, the main source of boneless beef for exports, during the first half of 1968. Imports of dressed beef and veal for the first seven months of 1968 at 21.6 million pounds are below the 30.3 million for 1967, but higher than the 1966 level of 15.2 million pounds for the same period.

Exports of Feeder Cattle—Exports of feeder cattle to the U.S. to August 31, 1968 totaled 54,186 head compared with 22,156 in 1967; 123,127 in 1966 and 103,271 in 1965 for the corresponding time period.

The bulk of the exports to date have been heifers due to the narrower spread between the price for feeder steers and the price of feeder heifers in the U.S. as compared with the situation in Canada. The decline in feeder steer exports reflects the ever-increasing demand from feedlot operators in Canada.

There is now a large, well-established cattle feeding business in Canada, as shown by the growth in the weekly average gradings of Choice and Good combined, from January 1, 1963 to date (Table 3).

Exports of Slaughter Cattle—Exports of slaughter cattle to August 31, 1968 totaled 27,146 head compared with 5,503 head in 1967, and 26,386 head for the same period in 1966. Imports of slaughter cattle from the U.S. to August 31, totaled 1,176 head below the 4,304 head for the same period in 1967.

Fed Cattle Prices in Canada—The highlight of beef prices in Canada is the length of the period in which price levels for Choice fed steers at Toronto have been above the "export basis".

In 1966, the price at Toronto went above in early September, and to a full "import basis" by December, and for that month the price at Toronto averaged \$4.20 above Omaha, and about 7,200 slaughter cattle were imported in the last quarter. The weekly average of Choice and Good combined in the last quarter averaged 26,304 compared with 28,542 in the third quarter, a drop of 2,238 weekly.

In 1967, the price at Toronto averaged \$3.52 above Omaha and again went to a full "import basis" in the last quarter during which time approximately 19,000 slaughter cattle came in. The weekly average of the combined Choice and Good for the last 3 months was 25,857—a drop of 2,883 from the average of 28,740 in the previous quarter.

In 1968, the price for the first month stayed well above the "export basis", an average of close to \$3.00 per cwt. By March, price levels had dropped back to approximately the export equivalent and during the January-August period, about 27,000 slaughter cattle went on export including some canner cows and bulls. Beginning in May, prices have stayed considerably above the "export basis" and, during the first half of September, Choice Steers at Toronto were close to \$2.50 per hundred pounds over the price for Choice Steers at Omaha.

The average weekly number of Choice and Good combined for the first 8 months of 1968 is 30,362—an increase of 1,492 from the weekly average of 28,845 in the year earlier period. For the 3-week period ending August 31, there was a record—an average of 34,302 weekly.

It is interesting to note that in 1963, with a weekly average of 21,306 Choice and Good, prices stayed on an "export basis". At that time, it was considered

TABLE 3—BEEF CARCASSES, CHOICE AND GOOD GRADES COMBINED, AVERAGE WEEKLY GRADINGS BY QUARTERS AND PER CENT OF TOTAL GRADINGS BY QUARTERS

Quarter	1968	1967	1966	1965	1964	1963
1st.....	29,308	27,600	25,258	26,384	23,863	20,663
Per cent.....	—	24.5	23.5	25.4	23.6	24.2
2nd.....	30,356	30,088	27,364	25,676	25,001	22,425
Per cent.....	—	26.8	25.4	25.0	24.7	26.3
3rd.....		28,740	28,542	27,280	28,248	21,290
Per cent.....		25.6	26.6	26.2	27.9	25.0
4th.....		25,857	26,304	24,418	24,087	20,844
Per cent.....		23.1	24.5	23.4	23.8	24.5
52 weeks.....		28,071	26,867	25,939	25,300	21,306
Total.....		1,459,714	1,397,080	1,348,871	1,315,612	1,107,953

that any time the gradings of Choice and Good combined went above 18,000 per week that prices would drop back to about the export equivalent. This year during March when the combined total of Choice and Good averaged 29,985 weekly, the price of Choice Steers was on an "export basis". However, during the period April 1-September 21, a total of 25 weeks, the weekly average of Choice and Good has been 31,370 and prices have risen above the export equivalent (Table 4), and to the extent of over \$2.00 per hundred pounds during the last week in September.

In summary, the price of Choice Steers to date in 1968 at Toronto has been surprisingly strong in view of the increase over 1967, in marketings of fed cattle. The average for the first eight months is a little over \$28.00 and, at Omaha, Choice Steers averaged approximately \$26.60 for the same period.

Fed Cattle Prices in the U.S.A.—Prices for Choice Steers at Omaha for the January-August period, in 1968, averaged about \$26.60 compared with approximately \$25.00 in the year-earlier period. In early September, the price was about \$27.60 about \$2.00 above the year earlier price. Beef production in the U.S. was about 1 per cent higher for the January-June period, than for the same six months in 1967. July and August brought substantial increases in slaughter and a sizeable rise in price—the June average for Choice Steers at Omaha, was \$26.39, the average for July was \$27.37 and \$27.54 for August.

Outlook

Cattle on Farms in Canada and the U.S.A.—The total number of cattle and calves on farms in Canada at June 1, 1968 as reported by D.B.S. was 12.6 million head (Table 5). In the U.S., the January 1, 1968 total was estimated at 108.8 million head (Table 6).

TABLE 4—PRICES OF CHOICE STEERS AT TORONTO AND OMAHA, BY MONTHS, JANUARY 1966 TO AUGUST 1968

	Toronto			Omaha			Toronto over Omaha 1968
	1966	1967	1968	1966	1967	1968	
	Canadian dollars per hundred pounds			U.S. dollars per hundred pounds			
January.....	27.74	28.50	28.66	25.91	24.94	25.69	2.97
February.....	28.72	28.50	27.80	27.16	24.32	26.37	1.43
March.....	28.32	27.85	26.81	28.25	23.92	26.60	.21
April.....	27.37	27.24	27.03	26.94	23.89	26.50	.53
May.....	26.85	27.50	27.96	25.94	24.75	26.30	1.66
June.....	26.08	28.33	28.50	25.25	25.45	26.39	2.11
July.....	25.64	29.22	28.86	25.27	26.18	27.37	1.49
August.....	25.56	30.06	29.36	25.76	26.57	27.54	1.82
September.....	27.24	30.50		25.54	26.63		
October.....	27.74	30.43		24.70	25.98		
November.....	27.61	30.00		23.92	25.34		
December.....	28.12	29.59		23.92	25.48		
Year.....	27.05	28.80	28.12*	25.71	25.29	26.60*	1.52*

* Eight-month simple average.

TABLE 5—CATTLE ON FARMS, JUNE 1, CANADA

	1958		1965		1967		1968		Per cent change from 1967 to 1968
	Number	Per cent of total	Number		Number		Number	Per cent of total	
	thousands				thousands				
Beef cows.....	2,011.5	18	3,035.0		2,968.2		2,920.2	23	-2
Beef heifers.....	771.9	7	1,102.1		1,058.4		1,003.4	8	-5
Dairy cows.....	3,028.0	28	2,795.0		2,668.0		2,616.4	21	-2
Dairy heifers.....	715.9	6	665.8		599.4		609.6	5	+2
Steers.....	1,182.8	11	1,723.4		1,722.4		1,736.3	14	+1
Calves.....	3,022.5	28	3,669.0		3,511.5		3,435.8	27	-4
Bulls.....	257.8	2	269.7		253.1		244.3	2	-4
Total.....	10,990.0	100	13,260.0		12,781.0		12,566.0	100	-2

TABLE 6—CATTLE ON FARMS, JANUARY 1, UNITED STATES

	1958		1965	1967	1968		Per cent change from 1967 to 1968
	Number	Per cent of total	Number	Number	Number	Per cent of total	
	thousands			thousands			
Beef cows.....	24,165	27	34,238	34,685	35,300	32	+2
Beef heifers.....	5,903	6	8,989	9,121	9,312	9	+2
Dairy cows.....	21,265	23	16,981	15,198	14,662	13	-4
Dairy heifers.....	5,126	6	4,149	3,636	3,566	3	-2
Steers.....	9,252	10	12,134	12,752	12,568	12	-2
Calves.....	23,846	26	30,601	31,383	31,510	29	—
Bulls.....	1,619	2	1,908	1,870	1,895	2	+1
Total.....	91,176	100	109,000	108,645	108,813	100	—

In both countries total cattle numbers reached a peak in 1965, after seven consecutive years of increase from the low in 1958. Numbers in both Canada and the United States declined in 1966 and again in 1967, however the decline has been small. In the United States, cattle numbers increased slightly between January 1, 1967 and January 1, 1968 and are expected to continue edging upward. Likewise in Canada, the decline in cattle numbers is expected to level off by 1969 and then move gradually upward. As in the past few years, the declines in the dairy sector will probably be more than offset by increases in beef cattle females.

Cattle on Feed in Canada—For the eight-week period ending September 21, 1968, the weekly average of Choice and Good combined has been 32,702—an increase of 3,820 head per week, or 13 per cent above the weekly average of 28,882 in the year-earlier period. This indicates that the volume of fed cattle to be marketed in the last quarter will be considerably higher than a year ago when Choice and Good averaged 25,857 weekly during the October-December period.

In respect to the volume of cattle and calves available to go into feedlots, the two tend to cancel each other out. The combined total of steers and calves on farms at June 1, 1968 was down 62,000 head or a little over 1 per cent. On the other hand, it is expected that the total of feeder cattle going on export between now and the end of the year may be less than in the same period of 1967.

The feedlot operator in Canada has recently been in a relatively favorable position with fed cattle prices considerably above the "export basis". Furthermore, the outlook in respect to both the supply and the price levels of feed grains is encouraging to the cattle feeder. As a result, there is a greater demand than a year ago from feedlot operators for cattle to be marketed out of feedlots during 1969. The feeding of

heifers represents a potential additional source of feeder cattle and in Canada, as is the case in the U.S., the trend is in that direction. Fed heifers in the U.S. now make up about 27 per cent of the kill compared with 23 per cent in Canada.

Feeder Cattle Prices in Canada—In October 1967, the average monthly price at Calgary for good feeder steers was \$27.14 and for steer calves \$31.58. Corresponding prices for mid-September 1968 are \$27.20 and \$31.20 respectively. In view of the ample feed supplies in both the main feeding areas, Ontario and Alberta, the trade expects that prices for replacement cattle may strengthen a little from present levels.

Cattle on Feed in U.S.A.—The U.S.D.A. July 1, 1968 Cattle on Feed Report showed a total increase of 7 per cent above July 1, 1967, and indicates that marketings in the last quarter of 1968 could run from 5 to 7 per cent above the year-earlier period.

There should be an adequate supply of feeder cattle available to maintain replacements. It is estimated that the 1968 beef calf crop is nearly 700,000 head larger than the 1967 crop. Furthermore, it is possible to feed out a larger number of heifers. Feed grains, i.e. corn and sorghum are both in abundant supply and indications are that feed costs will be lower than in the fall of 1967 and winter of 1968.

Under these circumstances, it is reasonable to expect that fed cattle marketings in 1969 will show some increase over 1968. Cattle on feed, September 1, in six major cattle-feeding states (Arizona, California, Colorado, Iowa, Texas and Nebraska), were reported to be up 11 per cent from the same date a year earlier. This indicates that the market will be well supplied with fed beef during the coming winter months.

Prices in the U.S.—Prices for Choice Steers at Omaha since July 1, 1968 have been remarkably steady and surprisingly high in view of increased

slaughter over a year ago. During July, beef production was up 12 per cent from July 1967, (9 per cent above June 1968) and prices averaged over \$1.00 per hundred pounds above the average for June. Marketings in August 1968 were also up about 8 per cent over a year ago and there was a small increase in price. Consumer demand is very high and the domestic market is taking more beef, close to 2 lb. per capita more than last year and at higher prices—an average of \$1.60 per hundred pounds more for Choice Steers during January-August.

The July 1 Cattle on Feed Report indicates an increase in fall marketings of 5 to 7 per cent compared to year-earlier levels. Therefore, there could be a decline of \$1.00 to \$1.50 per hundred pounds from early September levels which would mean Choice Steers prices in the \$26.25 to \$26.75 range. It is doubtful if prices will rise this fall, however in view of the pattern of marketings and prices since July 1, the trade is not very apprehensive about any sharp break in prices. Chicago futures for Choice Steers at the close of trading September 6, 1968 were as follows: October \$26.85; November \$26.20; December \$26.00.

In view of the expected increase in fed cattle coming to market in 1969, any substantial increase in prices is unlikely over the levels from the last quarter of 1968 until the late spring and early summer of 1969.

Prices in Canada—Prices in the last quarter should not change much from the early September average at Toronto of about \$29.50 for Choice Steers. The anticipated reduced weekly marketings of Choice and Good in the last quarter could result in Canadian fed cattle prices being reasonably close to a full "import basis". On that evidence, even if Omaha prices drop back close to the \$26.00 range, the price for Choice Steers at Toronto would not vary much, either up or down, from the levels in early September.

In view of an expected increase in cattle going on feed in Canada, the important question is "how large a weekly volume of Choice and Good will the Canadian domestic market absorb in 1969 at prices something above the export basis?" It would not appear possible that prices of fed cattle in 1969 would rise to any marked degree above the export equivalent until about September. However, in view of what has taken place during August and early September when the domestic market absorbed a weekly average of 32,600 combined Choice and Good at prices about \$2.00 over the "export basis," there may be reason to predict that prices in Canada will be above the export equivalent for most of the calendar year 1969.

CALVES FOR SLAUGHTER

Situation

Federally inspected calf slaughter to the end of August 1968 totaled 478,107 head (13,660 weekly), compared with 530,291 head (15,151 weekly) for the same eight months of 1967, a decrease of 9.8 per cent. The makeup of the veal kill to the end of August 1968 was 64 per cent male and 36 per cent female. Inspected calf slaughter in 1968 has been consistently below year-earlier levels throughout the first eight months with slaughtering in the East down 10.9 per cent and in the West down 5.4 per cent.

Domestic disappearance of veal to the end of July 1968, is estimated to total 46.6 million pounds, compared with 47.4 million for the same period in 1967, a decline of 2 per cent. The smaller decline in consumption in relation to slaughter is partly offset by the increase in the average weight per warm carcass, to 137.1 pounds from 130.9 in 1967. Exports of live veal calves to the United States totaled 115,398 head to the end of August 1968, up sharply from the 76,493 for the same period in 1967. All of the live veal exports originated in Eastern Canada and are a by-product of the dairy sector.

To the end of August 1968, monthly prices of Choice and Good veal calves at Toronto have averaged close to 1967 levels. The simple average price at Toronto for the first eight months of 1968 was \$37.10 per hundred pounds compared with \$37.25 for the same period in 1967. For August 1968, the price at Toronto was \$32.70 compared with \$33.63 for August 1967.

Outlook

The number of calves reported by the D.B.S. on farms, June 1, 1968, totaled 3,435.8 thousand head, down 2.2 per cent from the same date in 1967. Like total cattle numbers, calves on farms in Canada reached a peak in 1965 at 3,669.0 thousand head but to 1968 have declined by 6.4 per cent. In line with numbers on farms, inspected calf slaughter totaled 894,728 head in 1965 and then declined to 738,815 head in 1967. Calf numbers on farms in Canada are expected to level off in 1969 and then edge upward. In 1969, calf slaughter is expected to remain close to 1968 levels with prices averaging higher.

SHEEP AND LAMBS

Situation

Marketing of sheep and lambs on public stockyards and shipped direct to packing plants to the end of August 1968, totaled 165,843 head, compared with 183,155 head for the same period in 1967, a decline of

9.5 per cent. Live imports from the United States to the end of August 1968, totaled 20,167 head, slightly below the 22,047 head for the same period last year.

Carcasses graded in federally inspected and approved packing plants to the end of August, 1968, totaled 166,519 head, compared with 178,818 head for the same period one year ago, a decline of 6.9 per cent. Excluding imports for slaughter, the inspected kill of lamb and mutton was down 12.3 per cent in Western Canada but up 1.2 per cent in Eastern Canada.

Domestic disappearance of lamb and mutton to the end of July, 1968, declined slightly to 42.3 million pounds from 43.0 million for the same period in 1967, a decline of 2 per cent. During the January to July period of 1968, imports totaled 37.0 million pounds, compared with 33.7 million for the same seven months in 1967.

Monthly prices of Good Lambs at Toronto in 1968 were consistently above 1967 levels until August. The national average price of Good lambs, from April 1 to August 31, 1968, was \$30.12 compared with \$28.16 per hundred pounds for the corresponding period in 1967.

Outlook

Sheep and lamb numbers on farms June 1, 1968 were estimated by D.B.S. to total 891.2 thousand head, down 7 per cent from June 1, 1967. Numbers in Eastern Canada declined 3 per cent while numbers in the West dropped 11 per cent. In line with the decline in numbers on farms, marketings in 1969 will continue to decline. Prices can be expected to be at higher levels.

WOOL

Production of shorn wool in the spring of 1968 is estimated by D.B.S. at 3.5 million pounds, greasy basis, a drop of 8 per cent from the 3.8 million pounds produced in 1967. The decrease is due almost entirely to lower production in Western Canada. Eastern wool production has remained virtually unchanged from 1967. This is the first time since 1959 that there has not been a decrease in Eastern wool production. Both Ontario and Nova Scotia recorded sharp increases in shorn wool production. Average fleece weight for Canada is 7.5 pounds compared to 7.6 pounds in 1967.

For 1967, imports of wool into Canada totaled 55.2 million pounds, a decrease of 11 per cent from 1966 imports. Exports of wool at 3.4 million pounds were up by 12 per cent over 1966.

The price support program for wool is a deficiency payment program. The Agricultural Stabilization

Board pays producers the difference between the support price of 60 cents per pound and the average price of representative wool grades, f.o.b. Toronto. The stabilization year for wool is April 1 to March 31. In the 1966-67 marketing year, the wool deficiency payment was 18.3 cents per pound of wool and in 1967-68 the deficiency payment was 27.9 cents per pound.

In Canada, the decline in wool production between 1967 and 1968, as reported by D.B.S., is largely due to a 6 per cent drop in the number of sheep shorn, from 492,000 in the spring of 1967 to 462,000 in the spring of 1968. Sheep numbers on farms in Canada in 1969 are again expected to decline, with the 1969 wool clip also below the previous year's level.

HOGS

Situation

Origin of Hog Gradings (Canada)—Hog Gradings in Canada to the end of September 14, 1968 totaled 5,893,790 head (weekly average 159,291) compared with 5,649,071 head (weekly average 152,677) for the corresponding period in 1967, an increase of 4.3 per cent (Table 7).

Gradings in Western Canada were substantially above year-earlier levels by 10.6 per cent while in Eastern Canada only a slight increase occurred.

Gradings in Canada—Although monthly gradings in Canada have been consistently above year-earlier levels since the early fall of 1966, this difference was less pronounced in the first half of 1968 (Table 8). In fact, there was a substantial change in the monthly pattern of slaughter in Canada in 1968 when, during July and August, slaughter turned below year-earlier rates for the first time since August 1966, a period of 22 months.

The 1968 trends in production, on a regional basis, followed an unusual pattern with a sharp reduction in the East beginning in July and the West registering an increase over 1967 for each of the first eight months (Table 9).

The increase in numbers of hogs was the greatest in Alberta—135,048 head or 13.2 per cent. Ontario, which ranks first in gradings for the first seven months of 1968, and Quebec, which ranks second, both recorded sharp drops in August compared to 1967—9.6 and 14.4 per cent respectively.

Inspected Slaughter in the U.S.—The monthly inspected slaughter in the U.S. has been running above year-earlier levels since August 1966. To date in 1968, there has not been a consistent pattern—slaughter has been below the comparable period in 1967 for two months only, March and June. However, to the

TABLE 7—ORIGIN OF CARCASSES GRADED BY PROVINCE FOR THE FIRST 37 WEEKS
(TO SEPTEMBER 14, 1968) OF 1967 AND 1968

	1967	1968	Per cent change
	number		per cent
Newfoundland.....	7,381	7,754	+ 5.0
Prince Edward Island.....	88,795	99,671	+12.2
Nova Scotia.....	63,772	73,703	+15.6
New Brunswick.....	29,863	44,881	+50.2
Quebec.....	1,355,483	1,350,293	- 0.4
Ontario.....	2,041,177	2,036,019	- 0.3
East.....	3,586,471	3,612,321	+ 0.7
Manitoba.....	516,613	541,821	+ 4.9
Saskatchewan.....	412,123	445,317	+ 8.0
Alberta.....	1,099,875	1,250,956	+13.7
British Columbia.....	33,989	43,375	+27.6
West.....	2,062,600	2,281,469	+10.6
Canada.....	5,649,071	5,893,790	+ 4.3

TABLE 8—CANADA: WEEKLY AVERAGE HOG GRADINGS BY MONTHS;
UNITED STATES: TOTAL INSPECTED SLAUGHTER BY MONTHS; 1967 TO DATE

	Canada				United States			
	1967	Change from 1966	1968	Change from 1967	1967	Change from 1966	1968	Change from 1967
	thousand	per cent	thousand	per cent	thousand	per cent	thousand	per cent
January.....	156.9	+30.4	166.2	+ 6.0	6,292	+33.3	6,496	+ 3.2
February.....	154.4	+19.0	168.2	+ 9.0	5,661	+21.7	5,679	+ 0.3
March.....	155.4	+12.4	177.1	+14.0	6,727	+15.9	6,238	- 7.3
April.....	164.2	+23.6	170.3	+ 3.7	5,867	+10.6	6,483	+10.5
May.....	150.7	+19.2	163.0	+ 8.2	5,310	+ 8.0	6,407	+20.6
June.....	149.3	+23.4	156.5	+ 4.8	5,178	+10.8	5,125	- 1.0
July.....	145.6	+24.4	139.6	- 4.1	4,743	+12.2	5,454 ^a	+15.0
August.....	148.4	+19.5	140.2	- 5.5	5,808	+14.1	5,942 ^a	+ 2.0
September.....	156.1	+18.1			6,114	+ 3.8		
October.....	170.2	+12.9			6,685	+10.5		
November.....	179.8	+16.6			6,431	+ 3.7		
December.....	160.4	+17.6			6,100	- 1.9		
Year.....	157.4	+19.3	160.5 ^b	+ 4.9 ^b	70,915	+11.3	47,824 ^b	+ 5.0 ^b

^a Preliminary.

^b Eight months

TABLE 9—PERCENTAGE CHANGE IN HOG GRADINGS FROM 1967 TO 1968, JANUARY TO AUGUST, EAST,
WEST AND CANADA

Month	East	West	Canada
	per cent		
January.....	+ 1.7	+13.1	+ 6.0
February.....	+ 8.8	+ 9.2	+ 9.0
March.....	+11.1	+19.0	+14.0
April.....	+ 3.4	+ 4.3	+ 3.7
May.....	+ 6.9	+10.2	+ 8.2
June.....	- 0.9	+14.3	+ 4.8
July.....	-10.0	+ 6.8	- 4.1
August.....	-10.3	+ 3.4	- 5.5
8 months.....	+ 1.6	+10.5	+ 4.9

end of August, there was an increase of about 5.0 per cent over the same months in 1967.

Domestic Disappearance—Domestic disappearance of pork from commercial supplies from January to July of 1968 is estimated to average the equivalent of 155,800 carcasses per week, up 6 per cent from the weekly average of 146,700 carcasses during the corresponding period in 1967. This is the highest weekly average of domestic disappearance of carcasses for the seven-month period, January to July, on record.

Trade—Total exports of pork from Canada to the end of July 1968, were up to 37.2 million pounds (34.8 million to the U.S.) compared with 32.8 million in 1967 for the same period of which 31.4 went to the U.S. Imports, of which virtually all come from the U.S., totaled 8.6 million pounds to the end of July 1968, compared with 19.3 million for the same period in 1967.

Prices in Canada—In 1966, hog prices in Canada reached record levels (Table 10). The main reason for the favorable level of prices in early 1966 was the sharp reduction in slaughter which began in 1965 and continued into 1966. By midsummer, the period of declining hog slaughter in the current hog cycle was over. Since then, the monthly hog slaughter has remained above year-earlier levels until July 1968.

Through 1967, the general pattern of hog prices at Toronto was downward and monthly average prices were consecutively below 1966 levels. Gradings for

1967 were up 19.3 per cent over 1966. For the first eight months of 1968, Grade A at Toronto averaged about \$29.65 compared with approximately \$31.60 in the same period of 1967. At mid-September, the price at Toronto for Grade A was a little over \$34.00.

Prices in U.S.A.—The general pattern of marketings and prices has been similar to that in Canada. Prices reached record levels in 1966, following a sharp reduction in slaughter which started in 1965 and continued until August 1966. Since that time marketings, except for a brief period in December 1967, remained above year-earlier periods until March 1968.

Live barrows and gilts at eight Corn Belt markets averaged \$19.60 for the January-August period this year, a decrease of about 75 cents per hundred pounds from the average of \$20.35 in the comparable period of 1967.

Outlook

Hogs on Farms in Canada—The September 1, 1968 Quarterly Hog Survey indicates 5.8 million hogs on farms, down 8 per cent from the same date one year earlier. Farmers reported that farrowings from June-August (the first part of the fall pig crop) is down 4 per cent from the comparable period in 1967. They indicated that farrowings in the September-December period (the late fall pig crop) would be down 5 per cent from the same period in 1967. In both cases, the reduction is about the same percentage in both the East and the West.

TABLE 10—TORONTO, MONTHLY AVERAGE PRICE FOR GRADE "A" HOGS: UNITED STATES, MONTHLY AVERAGE PRICE FOR BARROWS AND GILTS ALL WEIGHTS AT EIGHT MIDWEST MARKETS, BY MONTHS, JANUARY 1966 TO DATE

	Toronto			U.S.A. 8 Midwest Markets					
	Grade A			Live			Dressed Equivalent		
	1966	1967	1968	1966	1967	1968	1966	1967	1968
	Canadian dollars			U.S. dollars					
January.....	42.73	32.31	28.11	27.93	19.46	18.31	37.24	25.95	24.41
February.....	43.19	33.39	28.60	27.80	19.38	19.41	37.07	25.84	25.88
March.....	36.12	31.69	27.97	24.41	18.43	19.07	32.55	24.57	25.43
April.....	32.90	29.93	26.98	22.26	17.62	19.00	29.68	23.49	25.33
May.....	36.83	32.52	28.27	23.16	21.83	18.88	30.88	29.11	25.17
June.....	38.29	32.38	30.81	24.72	22.29	20.43	32.96	29.72	27.24
July.....	35.12	30.44	32.30	25.09	22.58	21.48	33.45	30.11	28.64
August.....	33.98	30.26	34.22	25.75	21.05	20.12	34.33	28.07	26.82
September.....	33.92	30.08		23.16	19.46		30.88	25.95	
October.....	33.94	29.23		21.57	18.16		28.76	24.21	
November.....	33.79	27.73		19.87	17.36		26.49	23.15	
December.....	33.00	28.74		19.67	17.29		26.23	23.05	
Year.....	35.90	30.70	29.65 ^a	23.49	19.37	19.60 ^a	31.32	25.83	26.13 ^a

^aSimple average for eight months.

Hogs on Farms in the U.S.—The September 1, U.S.D.A. Hogs and Pigs Report shows that the number of all hogs and pigs on farms in ten Corn Belt states is estimated at 47.1 million head, up 1 per cent from the same date in 1967. Farmers in the ten Corn Belt states reported that they plan to increase farrowings by 4 per cent in the September-November 1968 period (the late fall pig crop). They also indicated the same increase 4 per cent for the December-February period (the early 1969 spring pig crop). These estimated increases in U.S. farrowings are in contrast to the intentions reported by Canadian producers.

Gradings in Canada—The pattern of hog slaughter for 1968 to date shows that the turning point in the current hog cycle took place about mid-year—gradings were above 1967 levels for the first half of the year. Gradings for the first and second quarters of 1968 were up 10 and 5.4 per cent, respectively. Hog gradings in the third quarter (July to September) of 1968 will average 143 thousand head per week, down 5 per cent from the weekly average of 150.5 thousand for the third quarter of 1967. On a quarterly basis, this is the first down-swing of hog gradings in Canada since the third quarter of 1966, two years ago.

Gradings for the last quarter of 1968 are expected to be 5 to 7 per cent below the weekly average of 169.4 thousand for the fourth quarter of 1967. This forecast is based on the expectation of marketings in the East continuing below year-earlier levels and gradings in the West staying close to the same period a year ago. For the year 1968, hog gradings are expected to be close to the high level of 1967 with a total of 8.2 million.

Looking ahead into 1969, gradings for the first 6 months are expected to be below the same period in 1968—possibly as much as 5 per cent. Reports from

farmers at June 1, 1968 indicated that the fall pig crop (June-November farrowings) would be 2 per cent below the 1967 fall pig crop. However, in the September 1 Quarterly Survey producers reported that the fall pig crop will show a decrease of between 4 and 5 per cent.

For the latter half of 1969, gradings will depend largely on the size of the spring pig crop (December 1968 to May 1969 farrowings). Spring pig crop may be somewhat higher from the same period a year ago, due to the expectation of a more favorable hog price-feed ration compared to the situation during October 1967 to March 1968. For the year 1969, total gradings are expected to be below the 1968 figures for at least the first three quarters of the year and will likely end up with a smaller total than in 1968.

Marketings in the U.S.—According to the U.S. Department of Agriculture, hog slaughter during the fourth quarter of 1968 is expected to be around 2 per cent below the same quarter of 1967—the late spring pig crop (farrowings March-May) is down 2 per cent. Hog slaughter in the first half of 1969 will come chiefly from the fall pig crop, which according to the U.S.D.A. estimates will be up 4 to 5 per cent over the same period a year ago.

If U.S. producers follow through on their intentions, market volume will likely be up 4 to 5 per cent during the first half of 1969. Fall marketings in 1969 depend on the size of the 1968 spring crop, i.e. farrowings in December 1968 to May 1969. In view of the favorable hog-corn ratio (19.4 at September 14, 1968 based corn at \$1.06 and hogs at \$20.55 live weight), it is reasonable to expect that the trend will be toward some increase in the 1969 spring pig crop.

In the first half of 1967, the hog-corn ratio averaged 14.6 but rose to an average of 16.7 in the second half (Table 11) and averaged about 16.3 during the last

TABLE 11—UNITED STATES HOG-CORN RATIO (AVERAGE PRICE OF BARROWS AND GILTS AT CHICAGO; AVERAGE PRICE PER BUSHEL OF No. 3 YELLOW CORN AT CHICAGO)

	1961	1962	1963	1964	1965	1966	1967	1968
January.....	15.8	16.0	13.3	12.2	12.9	21.8	14.1	17.1
February.....	16.1	15.5	12.8	12.4	13.4	21.7	14.2	17.7
March.....	15.9	14.7	11.6	12.0	13.1	19.6	13.5	16.9
April.....	15.9	14.4	11.7	11.6	13.5	17.5	13.1	17.0
May.....	14.7	13.6	12.4	11.8	15.3	18.4	16.3	16.4
June.....	15.0	14.9	13.4	12.9	17.6	18.8	16.6	18.2
July.....	15.7	16.4	14.5	14.3	18.7	18.0	17.5	19.8
August.....	16.2	17.0	13.3	13.9	19.5	17.5	17.4	19.3
September.....	16.6	17.1	11.9	13.5	18.0	16.3	16.6	
October.....	16.7	15.5	13.3	13.0	20.0	16.0	16.2	
November.....	14.9	15.6	12.9	12.5	21.9	15.7	16.8	
December.....	15.7	14.6	12.2	12.8	23.4	14.2	16.0	
Year.....	15.7	15.4	12.7	12.6	16.9	17.9	15.5	

quarter. The ratio moved up in the first half of 1968, rising to 19.8 for July and 19.3 in August. This is the most favorable ratio since early 1966 when hog prices were at extremely high levels. These advances in the hog-corn ratio since April 1967, have been largely due to lower prices for corn rather than higher hog prices. For example, in April 1967, hogs averaged \$17.81 and corn \$1.35 for a ratio of 13.1.

The trade expects that if the hog-corn ratio continues at close to its present ratio, the spring pig crop and thus the marketings in the latter half of 1969 could be considerably heavier than 1968 levels.

Prices in the U.S.—For the week ended September 20, 1968 the average price for barrows and gilts at 8 corn belt markets was \$20.25. The latter price averaged \$20.12 in August compared with \$21.48 in July, and \$20.43 in June, and about \$19.50 for Sep-

tember.

The late 1968 spring crop (farrowings March, April and May) in the U.S. is reported by the U.S.D.A. to be down about 2 per cent. If this proves to be correct, then the price drop in the fourth quarter of 1968 from September levels may not be very drastic; possibly to a low of about \$18.00 and average well above that of the last quarter in 1967 of \$17.60 at 8 Corn Belt markets.

Prices in Canada—Allowing for the relationship between hog prices at Chicago and Toronto, it is expected that with the seasonal increase in gradings, prices at Toronto will, in the last quarter, show some decrease from early September levels—possibly drop back to a \$32-\$33 range. Price levels may not show any sizeable increase from about that range until the usual seasonal rise in the summer months of 1969.

TABLE 12—MEATS: SUPPLY AND DISPOSITION FROM INSPECTED SLAUGHTERINGS OR CARCASS GRADINGS, CANADA, 1967 AND 1968

Unit	Pork	Beef	Veal	Mutton and lamb	Total meat
thousand pounds chilled carcass					
1967					
Stocks at January 1, 1967.....	31,094	48,479	3,678	13,952	97,203
Production.....	1,067,828	1,409,573	93,142	14,073	2,584,616
Imports.....	28,823	71,979	1,062	49,560	151,424
Total supply.....	1,127,745	1,530,031	97,882	77,585	2,833,243
Exports.....	63,533	33,743	6,195	184	103,655
Stocks at December 31, 1967.....	33,346	45,665	4,516	8,826	92,353
Domestic disappearance					
thousand pounds.....	1,030,866	1,450,623	87,171	68,575	2,637,235
thousand head.....	7,903	2,719	691	1,586	
Weekly average	152.0	52.3	13.3	30.5	
1968 ^a					
Stocks at January 1, 1968.....	33,346	45,665	4,516	8,826	92,353
Production.....	1,069,552	1,487,856	90,042	13,115	2,660,565
Imports.....	24,400	56,200	1,250	54,500	136,350
Total supply.....	1,127,298	1,589,721	95,808	76,441	2,889,268
Exports.....	60,200	54,000	5,100	90	119,390
Stocks at December 31, 1968.....	28,500	46,500	4,700	8,500	88,200
Domestic disappearance					
thousand pounds.....	1,038,598	1,489,221	86,008	67,851	2,681,678
thousand head.....	8,002	2,782	667	1,578	
Weekly average	153.9	53.5	12.8	30.3	

^a Estimated.

TABLE 13—HOGS: NUMBER ON FARMS AT JUNE 1, CANADA, 1956 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968
thousands					
Maritimes.....	143.6	153.8	174.5	201.0	207.0
Quebec.....	951.0	1,063.6	1,173.7	1,330.0	1,160.0
Ontario.....	1,724.7	1,846.5	1,935.6	2,040.0	1,995.0
Manitoba.....	390.3	407.5	499.2	578.0	526.0
Saskatchewan.....	687.0	506.9	488.2	565.0	508.0
Alberta.....	1,455.7	1,248.8	1,092.7	1,254.0	1,245.0
British Columbia.....	49.5	40.3	37.4	44.0	41.0
Eastern Canada.....	2,819.3	3,063.9	3,283.8	3,571.0	3,362.0
Western Canada.....	2,582.5	2,203.5	2,117.5	2,441.0	2,320.0
Total Canada.....	5,401.8	5,267.4	4,401.3	6,012.0	5,682.0

TABLE 14—PORK PRODUCTS: SUPPLY AND DISPOSITION, FROM CARCASS GRADINGS, CANADA, 1956 TO 1968 (COLD TRIMMED CARCASS BASIS)

Unit	Average 1956-60	Average 1961-65	1966	1967	1968 (Forecast)
Stocks at January 1.....thousand pounds	37,991	25,276	24,477	31,094	33,346
Carcass gradings.....thousand head	6,630	6,784	6,860	8,186	8,240
Average carcass weight.....pounds	130.1	129.4	130.1	130.4	129.8
Total carcass weight.....thousand pounds	862,857	878,186	892,216	1,067,828	1,069,552
Imports.....thousand pounds	4,450	51,643	37,402	28,823	24,400
Total supply.....thousand pounds	905,298	955,105	954,095	1,127,745	1,127,298
Exports.....thousand pounds	64,690	58,980	53,298	63,533	60,200
Surplus disposal ^a.....thousand pounds	26,746	—	—	—	—
Stocks at December 31.....thousand pounds	35,256	25,581	31,094	33,346	28,500
Domestic disappearance.....thousand pounds	778,606	870,544	869,703	1,030,866	1,038,598
.....thousand head	5,983	6,725	6,687	7,903	8,002
Weekly average.....thousand head	115.0	129.3	128.6	152.0	153.9

^a Under federal government price support operations.

TABLE 15—CATTLE AND CALVES: NUMBER ON FARMS AT JUNE 1, CANADA, 1956 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968
	thousands				
Maritimes.....	458.7	438.8	409.3	399.0	392.0
Quebec.....	1,943.4	1,926.8	1,797.6	1,796.0	1,847.0
Ontario.....	2,929.1	3,212.3	3,137.0	3,165.0	3,220.0
Manitoba.....	889.5	1,075.9	1,151.2	1,112.0	1,037.0
Saskatchewan.....	1,904.2	2,241.8	2,398.0	2,368.0	2,223.0
Alberta.....	2,589.5	3,121.3	3,439.7	3,405.0	3,322.0
British Columbia.....	417.8	507.0	546.0	536.0	525.0
Eastern Canada.....	5,331.2	5,577.9	5,343.9	5,360.0	5,459.0
Western Canada.....	5,801.0	6,946.0	7,534.9	7,421.0	7,107.0
Total Canada.....	11,132.2	12,523.9	12,878.8	12,781.0	12,566.0

TABLE 16—BEEF COWS AND HEIFERS: NUMBER ON FARMS AT JUNE 1, CANADA, 1956 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968
	thousands				
Maritimes.....	49.9	63.7	67.7	70.6	70.6
Quebec.....	102.9	108.5	108.8	110.0	115.0
Ontario.....	476.8	585.8	584.6	589.0	650.0
Manitoba.....	252.4	381.2	447.5	438.0	407.0
Saskatchewan.....	747.2	975.6	1,102.2	1,100.0	1,034.0
Alberta.....	1,044.7	1,313.0	1,480.5	1,504.0	2,437.0
British Columbia.....	145.5	188.7	223.0	215.0	210.0
Eastern Canada.....	629.6	758.0	761.1	769.6	835.6
Western Canada.....	2,189.8	2,858.5	3,253.2	3,257.0	3,088.0
Total Canada.....	2,819.4	3,616.5	4,014.3	4,026.6	3,923.6

TABLE 17—BEEF: SUPPLY AND DISPOSITION FROM INSPECTED SLAUGHTERINGS, CANADA, 1956 TO 1968

Unit	Average 1956-60	Average 1961-65	1966	1967	1968 (Forecast)
Stocks at January 1.....thousand pounds	33,120	39,736	51,832	48,479	45,665
Inspected slaughterings.....thousand head	1,887	2,271	2,705	2,642	2,780
Average carcass weights (chilled) pounds	495.8	519.0	529.1	533.6	535.2
Total carcass weights (chilled) ..thousand pounds	935,724	1,178,510	1,431,359	1,409,573	1,487,856
Imports.....thousand pounds	53,366	52,518	44,584	71,979	56,200
Total supply.....thousand pounds	1,022,210	1,270,764	1,527,775	1,530,031	1,589,721
Exports.....thousand pounds	32,367	38,406	62,714	33,743	54,000
Stocks at December 31.....thousand pounds	32,705	43,744	48,479	45,665	46,500
Domestic disappearance.....thousand pounds	957,138	1,188,614	1,416,582	1,450,623	1,489,221
thousand head	1,930	2,290	2,677	2,719	2,782
Weekly average.....thousand head	37.1	44.0	51.5	52.3	53.5

TABLE 18—VEAL: SUPPLY AND DISPOSITION FROM INSPECTED SLAUGHTERINGS, CANADA, 1956 TO 1968

Unit	Average 1956-60	Average 1961-65	1966	1967	1968 (Forecast)
Stocks at January 1.....thousand pounds	5,189	5,123	4,945	3,678	4,516
Inspected slaughterings.....thousand head	790	743	766	739	698
Average carcass weight.....pounds	108.5	122.1	124.4	126.1	129.0
Total carcass weight.....thousand pounds	85,736	90,759	95,264	93,142	90,042
Imports.....thousand pounds	b	b	455	1,062	1,250
Total supply.....thousand pounds	90,925	95,882	100,664	97,882	95,808
Exports.....thousand pounds	b	b	b	6,195	5,100
Stocks at December 31.....thousand pounds	5,226	5,029	3,678	4,516	4,700
Domestic disappearance.....thousand pounds	85,699	90,853	96,986	87,171	86,008
thousand head	790	744	779	691	667

* Chilled carcass basis, hide off.

^b Small quantities only and included with beef.

TABLE 19—SHEEP AND LAMBS: NUMBER ON FARMS AT JUNE 1, CANADA, 1956 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968
thousands					
Maritimes.....	173.0	114.7	82.2	79.5	78.2
Quebec.....	294.3	156.9	112.4	106.0	99.0
Ontario.....	374.4	311.0	265.4	259.0	252.0
Manitoba.....	74.6	74.6	50.5	46.0	41.0
Saskatchewan.....	163.5	159.8	127.8	120.0	118.0
Alberta.....	445.2	430.4	301.4	287.0	245.0
British Columbia.....	93.6	102.0	65.9	65.0	58.0
Eastern Canada.....	841.7	582.6	460.0	444.5	429.2
Western Canada.....	776.9	766.8	545.6	518.0	462.0
Total Canada.....	1,618.6	1,349.4	1,005.6	962.5	891.2

TABLE 20—MUTTON AND LAMB: SUPPLY AND DISPOSITION FROM INSPECTED SLAUGHTERINGS, CANADA, 1956 TO 1968

Unit	Average 1956-60	Average 1961-65	1966	1967	1968 (Forecast)
Stocks at January 1.....thousand pounds	5,993	8,829	6,743	13,952	8,826
Inspected slaughterings.....thousand head	573	528	328	325	305
Average carcass weight.....pounds	43.0	43.1	43.9	43.2	43.0
Total carcass weight.....thousand pounds	24,644	22,771	14,384	14,073	13,115
Imports.....thousand pounds	17,159	37,612	55,969	49,560	54,500
Total supply.....thousand pounds	47,796	69,212	77,096	77,585	76,441
Exports.....thousand pounds	550	507	622	184	90
Stocks at December 31.....thousand pounds	6,599	8,574	13,952	8,826	8,500
Domestic disappearance.....thousand pounds	40,647	60,131	62,522	68,575	67,851
thousand head	945	1,394	1,424	1,586	1,578

TABLE 21—SHORN WOOL: PRODUCTION IN CANADA BY PROVINCE, 1956 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968	1968 Per cent of total
	thousand pounds					per cent
Prince Edward Island.....	105	69	52	47	35	1.0
Nova Scotia.....	255	172	127	117	125	3.6
New Brunswick.....	215	143	91	92	88	2.5
Quebec.....	987	570	435	388	355	10.2
Ontario.....	1,362	1,190	1,073	922	958	27.6
Manitoba.....	247	235	163	163	137	3.9
Saskatchewan.....	712	684	595	506	506	14.6
Alberta.....	1,920	1,965	1,394	1,292	1,062	30.6
British Columbia.....	369	363	248	231	210	6.0
Eastern Canada.....	2,924	2,144	1,778	1,566	1,561	44.9
Western Canada.....	3,248	3,247	2,400	2,192	1,915	55.1
Total Canada.....	6,172	5,391	4,178	3,758	3,476	100.0

DAIRY PRODUCTS

SITUATION

The Canadian dairy industry is adjusting to a dynamic economic environment through substantial structural improvements being made at all levels of production and distribution. At the farm level, the number of milk shippers continues to decline. The 1966 Census showed that the number of farms with milk cows had declined from 309,000 in 1961 to 222,000 in 1966—a reduction of 87,000 during the period. Adjustments are continuing to take place at a high rate.

Although average annual yields per cow and the average size of herds have been gradually increasing, potential gains in milk production have been offset by a reduction in the number of cows. Adjustments in the number of farms have been much greater than in the number of cows. Thus, a reduced national herd, which decreased by 10.5 per cent between 1961 and 1966, was maintained by 28 per cent fewer farms. The trend to fewer herds has been caused by a decline in the number of farms keeping less than 18 cows for milking purposes, while the number with 18 cows or more has increased, due to existing farms enlarging their herds.

The number of milk cows on Canadian farms at June 1, 1968, was estimated at 2,616,000 head—down 2 per cent from the previous year. Declines were recorded in all regions except Quebec and British Columbia. While there was no change in British Columbia, cow numbers in Quebec increased nearly 2 per cent. There was a slight increase—about 2 per cent—in the numbers of one-to-two year dairy heifers being raised mainly for milk purposes. In Quebec, the number of heifers increased 11 per cent, which more than offset declines in all other regions, except British Columbia.

Total milk production in Canada in 1968 is estimated at 18.15 billion pounds—about one per cent below the previous year. Much of the decrease occurred in Ontario. Production has remained fairly constant since 1961.

Little change is expected in the milk utilization pattern. Because of the almost unchanged volume of production, the percentage utilized in milk and cream sales was larger, leaving slightly smaller amounts available for production of manufactured dairy products. About 61 per cent of the total milk produced in 1968 was utilized in the manufacture of dairy products, 30 per cent in sales of fluid milk and cream and 9 per cent remained on farms.

Fluid sales of milk and cream are estimated at 5.4 billion pounds, up 1.7 per cent from 1967. The buoyancy of partly skimmed milk sales continued to

be the force behind the uptrend in fluid sales. Sales of partly skimmed milk in 1968 are estimated at 432 million quarts—almost double the sales in 1964. Sales of standard and special milks have been declining. Total fluid usage sales of fluid milk and cream and farm-home consumption—amounted to 6.2 billion pounds in 1968.

Retention of whole milk on farms, which has been trending downward, declined still further in 1968.

Creamery butter production declined in 1968 for the sixth consecutive year. Output is likely to total 320.5 million pounds—down 9 million pounds from 1967. The decrease in butter production reflected the decrease in milk available for factory use and a diversion into products which have a higher value. Consumption of creamery butter is expected to be about 328 million pounds—down about 8 million pounds from 1967 and 29 million pounds less than the peak consumption of 1964. Per capita consumption is forecast at 15.8 pounds—down 0.6 pounds from the 16.4 pounds consumed in 1967.

Production of cheddar cheese will be about 161 million pounds—almost the same as the previous year. Production of other cheeses—all varieties made from whole milk, except cheddar—is expected to reach 33 million pounds, compared with 30 million pounds in 1967.

Domestic consumption of all natural cheeses, excluding cottage, is expected to reach a record high of 188.5 million pounds in 1968, mainly due to increases in specialty-type cheeses. Total consumption of cheddar, including processed cheddar, is expected to be 128 million pounds. Exports of cheddar cheese in 1968 will be around 30 million pounds. Imports of specialty-type cheeses are expected to reach 28 million pounds—a substantial increase from 1967. Consumption of cottage cheese continues to increase and production in 1968 will total 33.5 million pounds—an increase of 2 per cent from the previous year.

Production of ice cream mix, as a result of Centennial celebrations, reached an all-time high of 28 million gallons in 1967 and this level was almost maintained in 1968.

Concentrated milk products will utilize a little less milk in 1968 than in 1967, due largely to a reduction in output of whole milk powder. Production of evaporated and condensed whole milk is expected to approximate 319 million pounds, with consumption increasing slightly to about 315 million pounds. Exports of evaporated whole milk in 1968 changed little from the previous year, while whole milk powder exports—about one million pounds—reached the lowest level in nearly 25 years.

The trend towards smaller quantities of skim milk being used on farms continued in 1968. It is expected that this will result in about 350 million pounds of skim milk powder being manufactured.

Exports of skim powder may exceed 100 million pounds in 1968, while domestic consumption is expected to be around 160 million pounds.

Dairy Policy

The Federal government, through the Canadian Dairy Commission, supports Canadian dairy producers by means of direct subsidy payments to producers of manufacturing milk and cream and through offer-to-purchase programs for certain dairy products. For the current dairy support year, which began April 1, offer-to-purchase prices are established for Canada First Grade creamery butter, cheddar cheese and skim milk powder.

The offer-to-purchase price for creamery butter for 1968-69 was established at 63 cents a pound, and 20 cents per pound for spray-process dry skim milk. Support prices for both products were unchanged from the previous year. The offer-to-purchase price for cheddar cheese, which was 38 cents a pound during the previous support year, increased to an effective level of 47 cents and 42 cents per pound, depending on the season of production.

The offer-to-purchase program was designed to allow manufacturing plants to pay producers approximately \$3.54 a 100 pounds of milk testing 3.5 per cent butterfat. These returns from the domestic market were supplemented by a direct payment to producers at the rate of \$1.31 a 100 pounds of milk testing 3.5 per cent butterfat—up from \$1.21 in 1967-68.

Returns to producers from domestic and export markets are "pooled" by means of an export equalization charge made against the direct payments. A small portion of subsidy is held back for an equalization fund, which is used to assist in exporting dairy products at competitive prices.

In 1967-68 the Canadian Dairy Commission allocated subsidy eligibility quotas to individual shippers to the extent of their deliveries in the 1966-67 support year, except to those producers who had deliveries of less than 50,000 pounds of milk, or the equivalent in cream. The latter group was given an open quota up to 50,000 pounds of milk, or cream equivalent.

In further developing the quota policy, the 1968-69 policy provided for an increase of individual subsidy quotas for producers whose deliveries in 1967-68 exceeded that year's quota.

Producers having relatively small subsidy quotas of between 12,000 and 50,000 pounds of milk were re-

quired to reapply for them. Those producers who failed to reapply and those, whose deliveries had been below 12,000 pounds of milk (420 pounds of butterfat) in 1967-68, did not further participate in the subsidy quota program in 1968-69 but received an adjustment payment. Payment was made at the 1968-69 subsidy rate for the amount of the individual producer's 1967-68 deliveries of milk or cream.

OUTLOOK

With policy emphasis on rationalization of the industry at the farm level and on price stabilization of dairy products on the domestic market, little change in the production and consumption patterns is likely to occur in 1969.

On the supply side, indications point to a further decline in the national dairy herd, because farmers are turning to other enterprises or leaving the industry. Annual yield per cow is expected to continue trending upward. Assuming continuation of present dairy policy, milk production will be at about the same level as in 1968.

Total fluid sales are expected to increase by about 100 million pounds in 1969. Volume sales of partly skimmed milk (2 per cent butterfat) will continue to increase, but the percentage increase will probably be smaller than in 1968.

Production of cheddar cheese may be down slightly because of some manufacturing milk being diverted to the production of butter or other products. A continued increase in the total consumption of natural cheeses is anticipated.

Ice cream consumption is expected to regain the volume lost in 1968 and exceed the 1967 peak, if weather conditions are favorable.

Production of evaporated and condensed milk is expected to be slightly below 1968. No major change is forecast in consumption of these products. Production of whole milk powder will show little change.

Production of skim milk powder is expected to increase slightly. The conversion of cream shippers to whole milk shippers is believed to have levelled off.

Canada's annual supplies of skim milk powder surplus to domestic requirements are expected to be substantial for a number of years. These supplies will be available for commercial exports and food aid.

The amount of creamery butter produced depends on the volume of milk remaining after demands of the fluid market and other manufactured products have been met. Although the outlook is for little change in total milk marketings, and the proportion of milk going into fluid sales and other products is expected to remain relatively unchanged, there will be no appreciable change in butter production in 1968. A further reduction in butter consumption is expected.

TABLE 1—THE CANADIAN DAIRY HERD, TOTAL, AND BY PROVINCE, 1956 TO 1968 AS AT JUNE 1

	Average 1956-60	Average 1961-65	1966	1967	1968
thousand head					
Cows and Heifers, 2 years and over ^a					
Maritimes.....	192.5	159.1	141.9	135.0	131.4
Quebec.....	1,031.5	1,015.5	995.3	1,004.0	1,023.0
Ontario.....	989.2	958.5	908.7	925.0	905.0
Prairies.....	739.0	666.0	546.9	522.0	475.0
British Columbia.....	88.9	88.6	81.1	82.0	82.0
Canada.....	3,041.1	2,887.7	2,673.9	2,668.0	2,616.4
Yearling Heifers, 1 to 2 years ^a					
Maritimes.....	43.5	38.1	33.2	32.4	31.6
Quebec.....	220.1	221.3	198.2	186.0	207.0
Ontario.....	265.4	278.9	245.5	254.0	250.0
Prairies.....	170.1	152.4	116.9	107.0	99.0
British Columbia.....	22.6	24.4	21.7	20.0	22.0
Canada.....	721.7	715.1	615.5	599.4	609.6

^aBeing raised mainly for milk purposes.

TABLE 2—MILK PRODUCTION AND UTILIZATION IN CANADA, 1956 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968 (Preliminary)
million pounds of milk					
Consumed on farms.....	1,051	928	850	847	836
Farm-made butter.....	279	145	77	74	71
Fed to livestock.....	698	837	709	700	680
Total farm use.....	2,028	1,910	1,636	1,621	1,587
Fluid sales.....	5,106	5,053	5,255	5,284	5,374
Creamery butter.....	7,435	8,213	7,813	7,714	7,500
Cheddar cheese.....	1,085	1,492	1,850	1,774	1,771
Other cheese.....	115	173	288	324	366
Cottage cheese ^a	14	28	32	33	34
Concentrated milk.....	992	993	870	818	773
Ice cream.....	632	542 ^b	636 ^b	736 ^b	745 ^b
Total factory use.....	15,379	16,494	16,744	16,683	16,563
Total milk production.....	17,407	18,404	18,380	18,304	18,150
per cent of total milk production					
Consumed on farms.....	6.0	5.0	4.6	4.6	4.6
Farm-made butter.....	1.6	0.8	0.4	0.4	0.4
Fed to livestock.....	4.0	4.6	3.9	3.8	3.8
Total farm use.....	11.6	10.4	8.9	8.8	8.8
Fluid sales.....	29.3	27.4	28.6	28.9	29.6
Creamery butter.....	42.7	44.6	42.5	42.1	41.3
Cheddar cheese.....	6.2	8.1	10.1	9.7	9.8
Other cheese.....	0.7	0.9	1.5	1.8	2.0
Cottage cheese ^a	0.1	0.2	0.2	0.2	0.2
Concentrated milk.....	5.7	5.4	4.7	4.5	4.2
Ice cream.....	3.7	3.0	3.5	4.0	4.1
Total factory use.....	88.4	89.6	91.1	91.2	91.2
Total milk production.....	100.0	100.0	100.0	100.0	100.0

^aMilk equivalent of butterfat in creamed cottage cheese.^bExcludes the milk equivalent of butter used in ice cream mix, which was (in million pounds):

Average 1961-65	1966	1967	1968
255	270	221	203

TABLE 3—COMMERCIAL SALES^a OF FLUID MILK IN CANADA, BY VOLUME, 1964 TO 1968

	Commercial Fluid Milk Sales			
	Total ^b	Standard Milk	Special Milk	Two Per Cent Milk
thousand quarts				
1964.....	1,481,006	1,254,815	7,319	218,872
1965.....	1,520,959	1,253,445	6,220	261,294
1966.....	1,547,034	1,226,660	4,657	315,717
1967.....	1,567,507	1,191,662	3,762	372,083
1968.....	1,615,400	1,180,000	3,400	432,000

^a Covers sales by known operating plants and by producer-distributors in reporting marketing areas.

^b Excluding skim milk, buttermilk and chocolate drink.

TABLE 4—PRODUCTION OF CREAMERY BUTTER AND CHEDDAR CHEESE IN CANADA, BY PROVINCES, 1956 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968 (Preliminary)
thousand pounds					
Creamery butter					
Canada.....	317,731	350,979	333,906	329,655	320,500
Prince Edward Island.....	5,691	5,746	5,189	4,602	4,000
Nova Scotia.....	4,728	3,362	2,877	2,505	2,000
New Brunswick.....	7,987	6,641	4,913	4,431	4,000
Quebec.....	125,775	137,472	141,199	149,167	143,000
Ontario.....	83,857	103,474	103,123	97,994	98,000
Manitoba.....	24,795	24,231	18,868	17,071	17,000
Saskatchewan.....	27,554	25,898	19,031	16,256	16,000
Alberta.....	33,676	38,939	34,543	33,396	32,000
British Columbia.....	3,668	5,216	4,163	4,233	4,500
Cheddar cheese					
Canada.....	98,626	135,658	168,146	161,299	161,000
Prince Edward Island.....	944	1,240	1,974	2,448	2,000
Nova Scotia.....	—	—	565	1,242	1,000
New Brunswick.....	819	581	615	580	500
Quebec.....	29,184	54,118	69,627	64,248	70,500
Ontario.....	64,289	75,864	90,182	86,146	80,000
Manitoba.....	779	817	1,441	2,149	2,000
Saskatchewan.....	122	6	—	—	—
Alberta.....	1,745	1,974	2,302	3,103	3,500
British Columbia.....	744	1,058	1,440	1,383	1,500

TABLE 5—BUTTER: SUPPLIES, DISPOSITION AND PRICES, CANADA, 1956 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968 (Preliminary)
thousand pounds					
Creamery butter					
Stocks at January 1.....	91,635	177,539	75,302	61,228	57,239
Production.....	317,731	350,979	333,906	329,655	320,500
Imports.....	3	— ^a	— ^a	2,250 ^a	—
Total Supply.....	409,369	528,518	409,208	393,133	377,739
Exports.....	3,120	27,684 ^a	161 ^a	55 ^a	—
Stocks at December 31.....	98,176	166,049	61,228	57,239	49,739
Domestic disappearance.....	308,073	334,785	347,819	335,839	328,000
Domestic disappearance of butter					
Creamery butter.....	308,073	334,785	347,819	335,839	328,000
Dairy butter.....	11,927	6,179	3,311	3,164	3,000
Whey butter.....	2,440	4,255	4,980	5,443	5,500
Total butter.....	322,440	345,219	356,110	344,446	336,500
Cents per pound for Canada First Grade, 40-score, creamery butter					
Current receipts, Montreal.....	60.9	54.9	59.1 ^b	62.5 ^c	63.0 ^c

^a Data for 1965-67 excludes butter imported under special permit for processing into food products for re-export.

^b Agricultural Stabilization Board tenderable.

^c Canadian Dairy Commission tenderable.

TABLE 6—NATURAL CHEESE: SUPPLIES, DISPOSITION AND PRICES, CANADA, 1956 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968 (Preliminary)
thousand pounds					
Cheddar cheese					
Stocks at January 1.....	45,845	57,481	65,525	81,199	88,642
Production.....	98,626	135,658	168,146	161,299	161,000
Imports.....	31	7	—	—	—
Total Supply.....	144,502	193,146	233,671	242,498	249,642
Exports.....	14,694	26,650	35,204	26,026	30,000
Stocks at December 31.....	49,349	59,436	81,199	88,642	91,642
Domestic disappearance.....	80,459	107,060	117,268	127,830	128,000
Domestic disappearance of factory cheese					
Cheddar cheese.....	80,459	107,060	117,268	127,830	128,000
Other Canadian cheese.....	10,071	16,057	26,077	29,001	32,900
Other imported cheese.....	11,098	15,467	15,402	20,600	27,600
Total cheese.....	101,628	138,584	158,747	177,431	188,500
Cents per pound for Canada First Grade, Quebec white cheddar					
Current receipts, ^a Montreal.....	32.4	34.7	41.9	44.2	46.3

^a Price paid by wholesalers to manufacturers of cheddar cheese, Basis: delivered to Montreal.

TABLE 7—CONCENTRATED MILK PRODUCTS: PRODUCTION, DISPOSITION AND PRICES, CANADA, 1956 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968 (Preliminary)
thousand pounds					
Production					
Evaporated whole milk.....	309,378	310,916	309,696	288,107	294,000
Dry whole milk.....	26,009	23,023	7,732	8,352	3,000
Dry skim milk.....	146,749	201,322	263,508	316,378	350,000
Condensed whole milk.....	15,014	17,095	22,788	23,835	25,000
Exports					
Evaporated whole milk.....	4,483	8,269	8,499	7,290	7,500
Dry whole milk.....	20,269	21,241	6,710	4,872	1,000
Dry skim milk.....	42,328	54,546	69,447	94,973	100,000
Domestic disappearance					
Evaporated whole milk.....	303,590	303,776	299,970	289,825	290,000
Dry whole milk.....	4,340	3,616	1,298	4,684	2,700
Dry skim milk.....	105,105	146,320	163,640	139,899	160,000
Condensed whole milk.....	14,437	17,095	22,352	24,325	24,600
dollars per case					
Wholesale price, Montreal ^a					
Evaporated whole milk.....	6.20	6.62	7.33	7.71	7.80
cents per pound					
Dry whole milk.....	38.6	37.1	38.8	41.2	42.0
Dry skim milk (spray process).....	13.7	11.3	17.5	19.8	19.2

^a Simple average of monthly average prices for each year.

TABLE 8—ESTIMATED SUPPLY AND DISPOSITION OF MILK, CANADA, 1961-68

	Average 1961-65	1966	1967	1968 (Preliminary)
million pounds milk equivalent				
Stocks, at January 1 (actual).....	4,959	2,653	2,495	2,464
Production.....	18,404	18,380	18,304	18,150
Imports.....	172	201	313	325
Total supply.....	23,535	21,234	21,112	20,939
Domestic human consumption				
Fluid milk and cream.....	5,982	6,106	6,132	6,210
Butter.....	7,979	8,216	7,933	7,745
Cheese.....	1,538	1,771	1,971	2,074
Other products.....	1,365	1,431	1,529	1,500
Total.....	16,864	17,524	17,565	17,529
Fed to livestock.....	837	709	700	680
Exports.....	1,126 ^{a b}	473 ^a	361 ^a	355 ^a
Total disappearance.....	18,827	18,706	18,626	18,564
Stocks at December 31 (calculated).....	4,708	2,528	2,486	2,375

^a Data for 1965-67 excludes butter imported under special permit for processing into food products for re-export.

^b Includes butter equivalent of butter oil exports.

POULTRY MEAT AND EGGS

CHICKEN

Situation

Marketings of chicken at registered stations in Canada in 1968 will likely total 475 million pounds, eviscerated basis, compared with an output of 458 million pounds in 1967 and an annual average output of 317 million pounds in 1961-65 (Table 3). The percentage gain in 1968 output over 1967 and from the 1961-65 annual average will be about 3 and 49 per cent respectively. The increase of chicken production in Canada in 1968 from the level of the previous year was the smallest since 1962.

A reduction in chicken marketings in 1968 occurred during the first half of the year, and was a continuation of the cutback that had occurred in the last half of 1967. Broiler and roaster chicken markets in Canada from January to August in 1967 were generally over produced. Cold storage stocks of chicken had accumulated to the very high level of 21.9 million pounds at July 1, 1967, and live and wholesale prices had declined to comparatively low levels in the summer of 1967. The reduction in production during the last half of 1967 had the effect of reducing freezer stocks to about normal levels and of raising chicken prices to comparatively high levels by the beginning of 1968. Live prices of No. 1 broiler chicken at Toronto rose from a low of 19.0 cents per pound in September, 1967 to a high of 21.5 cents in August, 1968 (Table 5). A similar situation occurred at other leading live broiler chicken markets in Canada during this period. In the case of wholesale prices, Grade A chickens, under 4 pounds to retailers at Toronto rose from a monthly average level of 33.0 cents per pound in September 1967 to a summer peak of 38 cents in mid-August, 1968.

Monthly marketings of broiler chicken at registered stations in Canada rose above year ago levels in July, and marketings are expected to total 222 million pounds in the last half of 1968, up 10 per cent from the same period in 1967. If so, broiler chicken marketings in 1968 will total 420 million pounds compared with 407 million in 1967 and annual average marketings of 273 million pounds in 1961-65.

Most of the expansion in broiler chicken production in the second half of 1968 is expected to occur in Quebec and to a lesser extent in Manitoba and New Brunswick according to reports on broiler chick placements. In contrast, a more modest rise from year ago levels has occurred in those provinces having producer marketing boards and quota marketing controls.

Monthly marketings of roaster or heavy chicken at registered stations in Canada advanced beyond year ago levels in April, 1968, and will likely remain larger than in 1967 for the rest of this year. For the year, output of heavy chicken is estimated to total about 55 million pounds, up moderately from marketings of 51 million pounds in 1967.

With the introduction of a new hatchery report in January, 1968, chicks reported as placed for broiler production are now intended strictly for that purpose. Prior to 1968, broiler chick placements included some chicks for roaster production in all provinces, except Quebec, and some chicks for dual purpose farm flocks in all provinces, except Saskatchewan. This change in the method of reporting chick placements accounts for some reduction in placement statistics for broiler production, especially in Alberta, Manitoba and Ontario, provinces where roaster production is fairly important. In addition, 3.6 million broiler chicks were placed for dual purpose flocks in Western Canada in the first half of 1968, about 2.6 million of which had previously been reported as placed for broiler production, mostly in Alberta and Manitoba.

The upturn of broiler hatchery production in the second quarter of 1968 resulted in a substantial rise in imports of broiler hatching eggs from the United States in that period. Hatcheries in Central Canada, and to a lesser extent in Manitoba and the Maritimes accounted for most of the imports. Broiler hatching egg producers in British Columbia remained on an export basis. In the first half of 1968, imports of 19.2 million broiler hatching eggs accounted for about 16 per cent of requirements in this period. In contrast, 1.1 million hatching eggs were exported from British Columbia, accounting for about 11 per cent of the province's production.

Imports of chicks for roaster and broiler production in the first half of 1968 totaled 3.7 million, up slightly from the 3.6 million in the same period of 1967. Most of these were intended for roaster and broiler chicken production in Quebec, and about 720,000 were imported for replacements for broiler hatchery supply flocks.

Broiler supply flock numbers in Canada have been down from year earlier levels since March through July. In July, 1968, the latest month for which statistics are available, cumulative blood testings in the prior 8 months totaled 1,202 thousand compared with 1,385 thousand at the same date in 1967. Most of the reduction has occurred in Ontario and Quebec, but this has been offset to some extent by a sharp rise of numbers in Nova Scotia and New Brunswick. Cumulative placements of pullet chicks in Canada for

broiler supply flocks in the six months prior to August 31, 1965 were almost identical with placements in the same period of 1968.

Imports of live and of processed chicken into Canada in the January to August period of 1968 totaled about 4.0 million pounds, eviscerated basis, and were up from imports of 2.8 million pounds in the same period of 1967. Most of the increase was due to a sharp rise in the volume of live imports of heavy chicken for slaughter.

Outlook

Production of chicken in Canada in 1969 will likely increase about 20 to 30 million pounds from marketings of 475 million pounds in 1968, up about 4 to 7 per cent, considerably less than the annual average rate of increase of 10 per cent since 1963. The extent of the rise in chicken production will be determined mostly by the competitive supply of red meats, and especially of the supply of pork and pork products. Since Canadian hog marketings are forecast to remain below year-earlier levels in the first half of 1969, the percentage rise of chicken production in the first half of 1969 is expected to exceed the gains in output in the last half of the year.

Broiler chicken producer marketing boards are operating in all broiler producing provinces except Manitoba, Quebec and Newfoundland. Except for the producer boards in Nova Scotia and New Brunswick, the other boards are using marketing quotas as a means of supply management. As a result, the rate of industry growth may be somewhat less than has occurred in earlier years because producer price levels for chicken in board-controlled provinces will likely be slightly to moderately higher than would be the case without the use of supply restricting powers. The extent to which producer boards may raise prices by supply restriction is definitely limited by the prevalence of interprovincial and international competition in chicken, and to a lesser extent by inter-product competition between meats of various kinds.

TURKEYS

Situation

Marketings of domestic turkeys at registered stations in Canada will likely total about 184 million pounds in 1968, down 2 per cent from 188 million pounds marketed in 1967, and up 36 per cent from the annual average of 135 million pounds in 1961-65 (Table 3). All of the small reduction in turkey marketings in 1968 is expected to occur in the output of heavy turkeys while broiler turkey marketings (10 pounds and under, eviscerated weight basis) are estimated to equal output of this class in 1967.

In the case of broiler turkeys, marketings in the first half of 1968 at 30.9 million pounds were down by 4.4 million pounds or 12 per cent from the same period in 1967. This reduction represented a continuation of the cutback in broiler turkey production that began in the spring of 1967. At that time, it became evident that turkeys and poultry meat in general were heading into a period of continental over-production and low prices. Live prices of No. 1 broiler turkeys at London fell to 20.3 cents per pound in May, 1967, but thereafter rose steadily to 23.0 in March, 1968, as a result of the cutback in production, and have remained at that level since March (Table 7). Similar price patterns occurred at other live broiler turkey markets in Canada.

Broiler turkey marketings rose above year earlier levels in July, 1968, and are expected to remain larger for the rest of this year. Broiler turkey marketings in this period are estimated to total 36.1 million pounds, up 4.1 million pounds, or 13 per cent, from the volume of marketings in the same period of 1967. The upturn in broiler turkey production, as measured by placement of broiler poults, was quite sharp during July and August, due partly to expectations of a strong turkey market during the Christmas period (Table 1). Prior to that time, live broiler turkey prices could advance by 2-3 cents from current levels.

Production of heavy turkeys in Canada in 1968 was cutback from 1967 levels by 8.4 per cent, according to reports from registered hatcheries in the cumulative totals of poults placed from January to July inclusive. This cutback was a reflection of the uncertainty resulting from poor turkey markets that prevailed in North America in the latter part of 1967 and the first half of 1968. In 1967, United States turkey production was extremely large, with markets in that country becoming very weak. As a result, turkey producers in the United States reduced poult placements of heavy breeds to 93 million in the January to July period of 1968 from 113 million in the same period of 1967, a reduction of 18 per cent. Cold storage stocks of turkeys in the United States, which at January 1 were record large at 367 million pounds, were reduced rapidly during the following six months. During this period, turkey prices have strengthened considerably both in Canada and the United States.

Marketings of heavy turkeys (over 10 pounds, eviscerated weight basis) at registered stations in Canada during the first half of 1968, although seasonally small at 18.8 million pounds, were up moderately from marketings in the same period of 1967. All of the increase was due to a sharp upturn in the off-season production of heavy toms (mostly in Ontario), partly because of the growing demand for further processed turkey products and the desire to utilize

hatchery, growing and processing facilities more fully during the year. This upward trend in the first half of production of heavy toms is expected to continue in 1969. Most of the female poult hatched during this period are placed for broiler turkey production.

In the second half of 1968, marketings of heavy hens (over 10 pounds and under 16 pounds) are estimated to total 33.6 million pounds compared with Canadian heavy hen marketings of 36.0 million pounds in the same period of 1967. In the same period, Canadian marketings of heavy toms (16 pounds and up) are estimated to total 64.7 million pounds compared with Canadian heavy tom marketings of 69.6 million pounds in the same period last year. In total, heavy turkey marketings in the last half of 1968 are estimated to total 98.2 million pounds compared with Canadian heavy turkey marketings of 105.7 million pounds in the same period of 1967, a reduction of 7 per cent.

Practically all of the reduction in heavy turkey output in Canada in 1968 is expected to occur in Western Canada, according to statistics on poult placements during the January to July period. Poult placements for heavy turkey production in 1968 were reduced sharply from year ago levels in British Columbia and Saskatchewan. Reductions were moderate in Alberta and Manitoba while in Ontario and Quebec placements were almost equal with placements in the same period of 1967.

During the second half of 1967, live turkey imports from the United States totaled 4.9 million pounds, eviscerated weight basis. Turkey prices were low in the U.S. at that time and most of these turkeys were imported to fill the deficiency in domestic supplies at prevailing prices in Canada. For example, of the total live imports of 289,000 head, about 173,000 were hens that went into consumer markets during the Holiday Season. This is indicated by cold storage stock levels of turkeys in that class at January 1, 1968 which were down from the level of the previous year. Of the 116,000 imports of live toms, many of these ended in storage at January 1, but they were available to fill trade orders during the first half of 1968, and some were probably used for further processing. Cold storage stocks of heavy toms were moderately above prior year levels in this period, but so was domestic disappearance of turkeys of this class in the first half of 1968.

Because of a cutback in heavy turkey production in Canada in 1968, imports in 1968 could exceed those of 1967. However, U.S. turkey prices are likely to rise prior to the heavy demand period in order to ration reduced prospective supplies among various users in that country. Although live heavy hen imports into Canada from the United States were substantial in

August, it may become increasingly difficult to obtain additional turkeys at rising price levels expected in that country. As a result, live turkey prices in Canada during this period will be at or near an import basis in relation to U.S. price levels, and are expected to advance rather strongly prior to the Holiday Season.

Outlook

Projected demand for turkeys in Canada in 1969 indicates the need of an increase of 10 to 20 million pounds from output levels in 1968 or by more than five per cent. The extent of the rise will depend much upon the 1968 fall market situation. If the demand and price situation is as strong as expected, cold storage stocks at January 1 will be below normal levels. That will boost confidence in the 1969 outlook, and will likely result in a continuation of the higher trend now evident in broiler turkey production. Heavy turkey production is also likely to rise in 1969, but what the percentage increase will be or should be will be more evident upon having the cold storage stocks statistics at January 1. The lower level of feeding costs in 1968, as compared with feed costs in 1967, are expected to prevail during 1969.

The supply and price outlook for turkeys in the United States for 1969 is still rather vague, although production is likely to be up from 1968 output. Turkey markets in the United States were over produced in 1967 and a similar situation occurred in 1961. Sharp cutbacks of production followed in 1962 and 1968. On the basis of past experience from 1963 to 1966, U.S. turkey production in 1969 will be about in line with market requirements in that country.

The market demand for turkey in Canada in 1969 will likely approximate 225 million pounds, eviscerated basis. Growth in the demand for broiler weight turkeys will likely continue at a faster rate than the demand for heavies.

EGGS

Situation

Egg marketings at registered stations by producers in Canada will likely total about 8.7 million cases in 1968 compared with marketings of 8.5 million in 1967 and average annual marketings of 7.3 million cases during 1961-65. This will represent a percentage increase in 1968 egg marketings of 2 per cent above deliveries in 1967 and up 19 per cent on the average annual marketings for 1961-65 (Table 11). The entire increase in 1968 egg production and marketings occurred during the first nine months of this year. Canadian egg production reached a cyclical peak during the 1967-68 winter season and has been declining slowly but steadily since that time.

Egg marketings at registered stations in Canada in the second half of 1968 are expected to total 4.2 million cases, almost equal to egg marketings in the same period of 1967, but down both cyclically and seasonally from first half marketings of 4.5 million cases. In the last quarter of 1968, egg production and marketings are likely to drop below year ago levels for the first time since December, 1966, when the upward phase in the current egg marketing cycle began. Because of heavy production, the February 1967 to July 1968 period was one of generally low egg prices. However, since July 1968, egg prices have advanced rather sharply and are expected to remain at comparatively high levels during the rest of 1968 and throughout 1969.

The national cumulative weighted price to producers of Grade A Large in Canada for the 1967-68 program year, which began October 1 and ends September 30, will likely average about 33.7 cents per dozen, down 2.9 cents from the average level of 36.6 cents in the 1966-67 program year, and 0.3 cents per dozen from the deficiency support level of 34 cents. The maximum quantities of Grades A Extra Large, Large and Mediums on which registered producers are eligible for payments in 1967-68 are 10,000 dozens.

Egg prices to Canadian producers during the first half of 1968 remained stable, but at a relatively low level. The weighted average price to producers for all grades marketed at registered stations averaged 26.9 cents per dozen during January to June, 1968, down 2.1 cents from average prices in the same period a year earlier. Prices began to rise sharply toward the latter part of July and have been climbing steadily since that time. For the week ending September 14, 1968, the weighted price to producers for all grades in Canada was 37.5 cents, up 11.8 cents from the same date in 1967.

Similar changes in the 1968 egg supply and price situation have occurred in both the United States and Canada. Although Canadian egg prices were relatively low during the period from January to July, shell egg imports from the United States continued to occur, but at a considerably reduced volume in relation to the same period a year earlier. Shell egg imports to August 30, totaled 87,000 cases compared with imports of 177,000 cases in the same period of 1967. Most of these originated from the United States during April and May, a large portion of which consisted of breaking stock rather than of table eggs. However, imports of table quality shell eggs from the United States increased during August and are likely to rise in volume from September to December, a period during which Canadian markets are expected to be short of requirements.

In spite of the larger supply of eggs in Canada in the first eight months of 1968, the volume of liquid egg production in registered stations in Canada at 19.7 million pounds in this period was down by 17 per cent from output of 23.8 million in the same period of 1967. Part of this was due to (1) a decline in imports of breaking stocks from the United States, (2) the stability of table quality shell egg prices because of open market purchases by the Agricultural Products Board, and (3) to the high quality of egg marketings and the relative shortage of undergrade eggs during this period. Although egg marketings from January to August were up by 6.4 per cent, marketings of B's were larger by only 1 per cent.

Imports into Canada of frozen egg products in the first nine months of 1968 were very small. As a result, inventories of egg products in Canada at the present time are not unduly large, and much larger imports of either breaking stock and/or of egg products are expected in the next several months.

Placements of chicks from registered hatcheries in Canada for commercial layer replacement purposes fell below the year ago level in June 1967, and remained lower until July 1968 (Table 1). The twelve month, cumulative total of chicks placed to July 31, was 22.4 million compared with 25.7 million in the same period a year earlier, a reduction of 16 percent. Consequently, the size of the national laying flock in 1969 is expected to be smaller than in 1968, but by something less than the indicated reduction in the supply of started pullets. Two factors will help to support egg production in the rest of 1968 and in 1969.

Firstly, the rate of layer culling in the first eight months of 1968 was sharply smaller than in the same period a year ago. This was indicated by domestic fowl marketings at registered stations in Canada of 6.6 million head compared with deliveries of 7.2 million in the same period of 1967. There were reports of some producers having force molted layers last spring in anticipation of the strong egg market situations from July onward. Recycling of hens for further production will likely be more prevalent this fall than was the situation a year ago.

Secondly, 3.6 million dual purpose mixed chicks of broiler breeding were placed on farms in Western Canada in the first half of 1968. In the hatchery reports of prior years, about 0.7 million of these dual purpose pullet placements were included in chicks placed for commercial egg production in Saskatchewan, and these are not included in 1968 commercial placements. In other provinces, they were reported as chicks placed for broiler production. The change in the method of reporting reflects more clearly the extent of placements for commercial egg production

and for general family farm flock production in the Prairie Provinces.

Outlook

Canadian egg marketings at registered stations in 1969 will likely total about 8.2 million cases, down 6 per cent from total marketings in 1968. The pattern of seasonal distribution of egg marketings and prices in 1969 will likely resemble the 1966 pattern, except that egg production in the last half of 1969, could be comparatively larger and prices lower than was the situation in 1966 when a marked egg shortage occurred. Hatchery orders and placements of chicks during August were up from a year ago and this higher trend is expected to continue. Although the main hatching season is now past, and fall and winter placements are comparatively small, they will nevertheless boost layer numbers and egg production in the later months of 1969 when supplies are likely to be relatively short (Table 8).

The anticipated reduction in Canadian egg production in 1969 is expected to push average egg prices to a much higher level than in 1968, especially so until August. A similar outlook is forecast for the United States. Higher price levels in Canada will likely attract shell egg imports from the United States to a greater extent in 1969 than was the situation in 1968. Egg product imports from other countries are also likely to rise sharply in 1969.

One of the main dangers in the 1969 egg market is that it may rise too much and encourage a too rapid expansion of egg production by 1970. Chick placements for egg production in 1969 should probably be about 24 million if egg production in 1970 is to be limited to market requirements at remunerative egg prices to producers. However, Canadian egg producers will have to remain competitive with production and prices in the United States or risk a portion of their Canadian market to a larger volume of egg imports from that country.

TABLE 1—CHICKS AND POULTS PLACED ON FARMS IN CANADA, BY MONTHS, 1965 TO 1967

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
thousand													
Egg Production													
Chicks													
1965.....	1,167	1,317	2,891	4,397	4,178	2,237	1,182	1,025	950	1,076	1,089	1,259	22,768
1966.....	1,311	1,663	3,161	3,947	3,853	2,516	1,461	1,342	1,423	1,385	1,464	1,539	25,065
1967.....	1,610	1,834	2,977	4,287	4,114	2,391	1,337	1,188	1,196	1,246	1,346	1,325	24,851
1968.....	1,373	1,550	2,453	3,771	3,418	2,242	1,328	1,483					
Broiler chicks													
1965.....	10,026	9,861	11,676	12,103	12,810	12,383	11,857	11,306	10,845	10,217	10,802	11,178	135,064
1966.....	11,357	11,363	13,004	13,769	14,698	13,859	13,243	12,956	12,052	11,983	11,690	12,992	152,966
1967.....	13,732	12,113	14,429	15,094	15,707	14,437	12,683	11,676	12,001	11,173	10,293	12,736	156,074
1968.....	12,497	11,874	13,061	14,075	14,412	14,194	15,190	13,582					
Broiler weight													
Turkey Poults													
1965.....	544	573	684	548	603	773	797	715	633	706	854	841	8,271
1966.....	578	704	760	810	690	962	1,081	999	902	800	1,041	1,014	10,341
1967.....	881	745	711	641	640	787	946	907	749	706	667	663	9,043
1968.....	742	521	665	697	786	729	1,004	1,146					
Heavy weight													
Turkey poults													
1965.....	204	537	1,672	2,049	1,912	959	455	113	36	57	93	134	8,221
1966.....	245	575	1,834	2,290	2,007	972	495	105	62	61	36	184	8,866
1967.....	354	738	1,923	1,979	1,740	1,159	616	170	97	103	190	223	9,292
1968.....	239	687	1,653	2,113	1,600	1,006	509	323					

TABLE 2—PRODUCTION OF POULTRY MEAT IN CANADA, BY PROVINCE, 1956-60 TO 1968^a

	Average 1956-60	Average 1961-65	1966	1967	1968 ^a
thousand pounds eviscerated weight basis					
CHICKEN AND FOWL					
Canada.....	340,679	460,146	568,541	601,331	615,000
Prince Edward Island.....	2,237	1,239	1,021	943	1,000
Nova Scotia.....	8,845	14,508	18,849	17,986	19,000
New Brunswick.....	5,315	5,721	9,593	10,418	12,000
Quebec.....	74,622	146,303	198,747	215,531	220,000
Ontario.....	146,656	164,653	194,009	205,846	208,000
Manitoba.....	24,296	26,383	31,709	32,506	35,000
Saskatchewan.....	22,676	22,580	20,928	23,765	24,000
Alberta.....	31,282	42,457	51,304	50,789	52,000
British Columbia.....	24,754	36,302	42,381	43,547	45,000
TURKEY					
Canada.....	105,466	157,210	213,127	207,639	205,000
Prince Edward Island.....	294	168	125	95	
Nova Scotia.....	961	894	1,161	1,650	2,000
New Brunswick.....	719	574	1,797	1,909	2,000
Quebec.....	13,796	20,362	35,987	35,556	36,000
Ontario.....	36,966	71,090	108,538	100,506	104,000
Manitoba.....	14,996	20,535	21,363	19,849	18,000
Saskatchewan.....	15,796	17,323	12,898	10,751	10,000
Alberta.....	14,325	17,216	16,977	19,391	18,000
British Columbia.....	7,613	9,048	14,281	17,932	15,000

^a Total production includes output not marketed through registered processing plants.^b Preliminary estimate.TABLE 3—POULTRY MARKETINGS THROUGH REGISTERED PROCESSING PLANTS BY KINDS IN CANADA, 1961-65 TO 1968^a

	Chicken	Fowl	Turkey	Duck and Goose	Total
thousand pounds eviscerated weight basis					
Average					
1956-60.....	190,629	51,170	84,816	3,021	329,636
1961-65.....	316,860	37,550	134,739	3,711	492,860
1965.....	376,005	36,914	163,230	4,262	580,411
1966.....	423,442	38,240	187,809	4,397	653,888
1967.....	457,712	38,919	193,374	4,484	694,489
1967 January to September 9.....	324,364	27,156	90,065	2,061	443,646
1968 January to September 7.....	322,663	23,834	91,507	2,433	440,437

^a Includes live poultry imports for slaughter.

TABLE 4—SUPPLY AND DISPOSITION OF POULTRY MEAT, CANADA, 1956-60 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968 ^a
thousand pounds eviscerated weight basis					
CHICKEN AND FOWL					
Stocks at January 1.....	18,534	17,152	17,896	24,350	23,053
Production ^b	340,679	460,146	568,541	601,331	615,000
Imports.....	9,086	6,846	10,013	10,342	11,000
Total supply.....	368,299	484,144	596,450	636,023	649,053
Exports.....	284	771	808	361	
Stocks at December 31.....	18,992	17,756	24,350	23,053	20,000
Domestic disappearance.....	349,023	465,617	571,292	612,609	629,053
TURKEY					
Stocks at January 1.....	13,388	19,216	24,736	30,296	30,788
Production ^b	105,466	157,210	213,127	207,639	205,000
Imports.....	5,115	4,106	255	6,142	4,000
Total supply.....	123,969	180,532	238,118	244,077	239,788
Exports.....	20	248	1,062	65	—
Stocks at December 31.....	13,664	22,048	30,296	30,788	20,000
Domestic disappearance.....	110,285	158,236	206,760	213,224	219,788

^a Estimated, except for stocks at January 1, 1968.^b Total production includes output not marketed through processing plants.

TABLE 5—BROILERS: MONTHLY AVERAGE PRICES PAID TO PRODUCERS FOR LIVE BROILERS AT TORONTO, 1956 TO 1968

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
cents per pound													
Average													
1956-60 ^a	19.3	21.3	21.6	21.1	21.3	22.5	23.2	20.4	18.6	17.7	17.5	18.3	20.2
Average													
1961-65.....	17.8	18.5	18.1	17.4	16.9	17.8	19.0	18.7	17.9	17.6	17.4	18.1	17.9
1966.....	20.4	21.1	21.2	21.1	20.5	20.5	19.8	20.5	20.5	20.5	20.5	20.0	20.6
1967.....	19.1	19.5	20.0	20.0	19.6	19.0	19.5	19.3	19.0	19.2	19.8	20.5	19.5
1968.....	20.8	20.5	20.1	20.8	21.0	21.1	21.5	21.5	21.5				

^a Under 4 pounds prior to 1963; under 5 pounds 1963 to date.

TABLE 6—LIGHT FOWL: MONTHLY AVERAGE PRICES PAID TO PRODUCERS FOR LIVE No. 1 AT TORONTO, 1956-60 TO 1968

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
cents per pound													
Average													
1956-60 ^a	14.5	14.3	15.3	15.5	15.1	14.5	14.4	13.6	12.2	11.5	11.7	12.1	13.7
Average													
1961-65.....	9.5	9.4	9.8	10.5	10.6	10.5	10.5	10.3	10.1	9.4	9.6	10.0	10.0
1966.....	10.5	11.0	12.2	13.8	14.1	15.0	13.6	12.0	11.8	10.5	10.5	10.8	12.2
1967.....	10.9	11.0	11.2	10.5	9.2	8.2	6.5	5.5	7.2	7.2	7.5	7.5	8.5
1968.....	7.5	7.5	8.2	8.7	10.0	10.5	10.3	9.5	9.5				

^a Under 4 pounds prior to 1962; under 5 pounds 1962 to date.

TABLE 7—TURKEYS: MONTHLY AVERAGE PRICES PAID TO PRODUCERS FOR LIVE No. 1 AT LONDON, ONTARIO, 1958^a TO 1968

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
cents per pound													
Under 12 pounds ^b													
Average													
1958-60.....	30.3	29.7	29.8	29.9	30.0	29.0	28.3	26.6	28.0	28.9	29.9	30.3	29.2
1961-65.....	23.2	23.0	23.8	24.4	23.8	23.9	24.0	24.0	24.5	24.8	25.1	24.6	24.1
1966.....	24.0	24.6	24.0	23.8	22.6	22.3	22.1	22.0	23.0	23.0	23.0	22.9	23.1
1967.....	22.1	22.1	21.5	20.5	20.3	21.0	21.0	21.1	22.1	22.9	22.6	22.5	21.6
1968.....	22.2	22.9	23.0	23.0	23.0	23.0	23.0	23.0	23.0				
Over 12 and under 20 pounds ^c													
Average													
1958-60.....	30.5	30.8	31.7	34.6	30.4	28.9	28.3	27.2	28.7	29.5	30.9	31.4	30.0
1961-65.....	25.7	25.2	24.9	25.2	25.1	25.0	24.9	24.9	25.7	25.9	27.6	27.7	25.7
1966.....	28.8	27.1	24.6	24.5	24.5	24.2	23.4	23.7	25.0	25.5	26.5	27.2	25.4
1967.....	24.0	23.8	23.0	22.8	22.9	23.0	23.0	23.1	24.0	24.9	24.8	25.2	23.7
1968.....	22.6	23.0	23.0	23.4	23.5	23.5	23.9	24.1	25.2				
20 pounds and over													
Average													
1958-60.....	27.9	28.9	30.3	30.6	30.0	28.6	27.3	24.8	24.8	24.8	25.8	26.8	27.9
1961-65.....	24.9	26.1	25.9	25.8	26.2	26.9	25.4	23.5	23.6	23.1	23.5	24.1	24.9
1966.....	26.0	26.5	25.6	25.6	25.6	25.8	24.8	23.0	23.0	23.0	23.4	23.7	24.7
1967.....	25.9	26.6	26.8	25.8	26.3	26.2	24.4	23.0	23.0	23.0	23.0	23.0	24.8
1968.....	23.8	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0				

^a Prices not available prior to 1958.

^b Under 10 pounds prior to 1963.

^c Over 10 and under 20 pounds prior to 1963.

TABLE 8—EGG TYPE CHICK PLACEMENTS IN CANADA, WESTERN CANADA, AND EASTERN CANADA, BY QUARTERS, 1964 TO 1968

	1964	1965	1966	1967	1968 ^a
	millions				
Canada					
January to March.....	7.8	5.4	6.2	6.4	5.4
April to June.....	12.4	10.8	10.3	10.8	9.4
July to September.....	2.8	3.2	4.2	3.7	4.2
October to December.....	3.0	3.4	4.4	3.9	
Total year.....	26.0	22.8	25.1	24.8	
Western Canada					
January to March.....	3.3	2.3	2.6	2.7	2.2
April to June.....	6.2	5.5	5.2	5.2	4.3
July to September.....	0.9	0.9	1.4	1.2	1.3
October to December.....	1.0	1.2	1.4	1.3	
Total year.....	11.4	9.9	10.6	10.4	
Eastern Canada					
January to March.....	4.5	3.1	3.6	3.7	3.2
April to June.....	6.2	5.3	5.1	5.6	5.1
July to September.....	1.9	2.3	2.8	2.5	2.9
October to December.....	2.0	2.2	3.0	2.6	
Total year.....	14.6	12.9	14.5	14.4	

^a Estimated for September.

TABLE 9—EGGS: PRODUCTION IN CANADA, BY PROVINCE, 1956-60 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968 ^a
	thousand dozen				
Canada.....	432,976	430,549	416,803	442,176	450,000
Prince Edward Island.....	5,248	4,062	3,176	3,055	3,000
Nova Scotia.....	18,380	18,453	19,854	18,757	20,000
New Brunswick.....	7,838	9,145	8,745	8,338	8,000
Quebec.....	61,444	70,469	74,497	78,962	76,000
Ontario.....	180,732	175,931	158,156	169,324	179,000
Manitoba.....	36,674	39,172	42,836	48,645	50,000
Saskatchewan.....	39,818	29,079	22,330	20,972	18,000
Alberta.....	46,811	38,785	38,715	39,309	38,000
British Columbia.....	36,031	45,453	48,494	54,814	58,000

^a Preliminary estimate.

TABLE 10—EGGS SUPPLY AND DISPOSITION, CANADA, 1956-60 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968 ^a
	thousand dozen				
Stocks at January 1.....	8,196	5,172	5,490	4,590	7,830
Total production.....	432,976	430,549	416,803	442,176	450,000
Imports ^b	2,476	5,160	17,734	19,654	15,000
Total supply.....	443,648	440,881	440,027	466,420	472,830
Exports ^b	14,759	2,603	1,070	1,045	1,000
Used for hatching.....	14,139	18,687	23,295	23,488	24,000
Stocks at December 31.....	8,154	5,064	4,590	7,830	5,000
Apparent use as food.....	406,596	414,527	411,072	434,057	442,830

^a Estimated, except for stocks at January 1, 1968.

^b Includes eggs for hatching.

TABLE 11—EGGS: COMMERCIAL MOVEMENT, 1956 TO 1968

	Receipts at registered stations	Inspected for exports	Inspected shell egg imports ^a	Frozen in Registered Plants	Movement to consumer outlets ^b
thousand cases of 30 dozen					
Average					
1956-60.....	6,797	348	19	559	5,909
1961-65.....	7,303	58	79	530	6,794
1966.....	7,537	6	257	468	7,318
1967.....	8,509	—	300	770	8,038
1967 January to September 9.....	5,865	—	179	621	5,423
1968 January to September 7.....	6,236	1	94	525	5,804

^a Does not include eggs for hatching.^b Adjusted for change in storage stocks.

TABLE 12—AVERAGE WEIGHTED EGG PRICES TO PRODUCERS FOR CANADA GRADE A, LARGE SIZE, 1962-63 TO 1967-68

	Last week of the month						Cumulative from October 1					
	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68
	cents per dozen						cents per dozen					
October	37.8	44.3	32.4	50.7	50.4	35.0	42.7	47.0	30.9	50.0	50.4	35.4
November	46.8	37.9	26.7	51.7	50.3	33.2	43.6	43.3	30.2	49.1	50.2	34.5
December	33.8	32.4	29.0	42.6	45.2	33.2	40.0	40.4	29.8	48.6	49.7	34.2
January	28.4	30.3	21.8	34.4	34.9	29.1	37.0	37.8	27.9	44.8	46.8	33.3
February	37.7	31.1	25.8	37.2	32.8	29.5	36.0	36.0	27.2	43.2	43.9	32.5
March	34.8	28.9	27.2	43.5	35.2	32.5	36.4	35.0	27.1	42.6	41.8	32.2
April	33.7	26.9	29.4	43.2	32.8	31.9	36.4	33.9	27.4	42.7	40.6	32.2
May	32.2	23.1	28.8	35.6	29.7	30.1	35.9	32.4	27.7	42.1	39.3	32.0
June	30.8	25.9	29.2	34.8	28.1	30.2	35.5	31.7	27.7	41.2	38.1	31.8
July	39.1	30.2	32.2	44.4	32.7	35.9	35.6	31.3	28.0	41.0	37.0	31.9
August	41.6	38.8	39.6	50.8	35.0	42.0	36.0	31.7	28.8	41.7	36.9	32.6
September	50.1	30.7	47.3	50.2	36.6	48.5	36.8	32.0	29.7	42.4	36.7	33.6

TABLE 13—EGGS: MONTHLY WEIGHTED AVERAGE PRICES RECEIVED BY FARMERS FOR ALL GRADES OF EGGS AT REGISTERED STATIONS, CANADA, 1956 TO 1968

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
cents per dozen													
Average													
1956-60.....	28.0	29.3	33.3	32.0	30.1	30.5	34.5	35.9	36.5	36.6	33.9	29.1	32.2
1961-65.....	25.9	28.3	29.9	28.7	26.2	26.3	28.8	33.1	36.0	37.5	36.2	31.8	30.5
1966.....	32.0	34.0	37.6	41.4	36.5	32.1	34.8	44.2	45.0	45.4	46.1	44.9	39.4
1967.....	35.3	29.8	29.9	29.9	26.4	23.8	23.8	28.4	28.3	29.2	28.3	29.0	28.4
1968.....	26.0	25.9	27.9	28.6	26.6	26.0	28.3	33.4	40.2				

FRUITS, VEGETABLES, HONEY AND MAPLE PRODUCTS

FRUITS AND VEGETABLES

Developments and Trends

There have been continuing developments in the production and marketing of the thirty-one major fruit and vegetable crops during the past year. The introduction of sophisticated methods and techniques using computers increased research productivity, particularly in the selection of new plant strains. Better yields resulted from an increased use of new varieties and improved cultural practices. To date, major plant breeding programs for peaches at Harrow included two hardy, size controlling rootstocks and a series of fifteen new selections of peaches and nectarines. This includes breeding materials which with further research and testing are expected to have exceptional winter hardiness. New growth regulators have improved the rate of flow and condition of fruit en route to storage or the market.

There was increasing use of mechanical harvesting of crops grown for processing purposes. Considerable experimental work took place in southwestern Ontario on mechanical harvesters for tomatoes. Progress is dependent upon the development of varieties of tomatoes whose characteristics of texture and uniformity of maturity are suitable. Improvements in the mechanical harvesting of cucumbers continued. Various fruit crops are now being harvested with mechanical assistance, and research in this area is continuing.

The condition and marketing period of fruit was improved and extended by the greater number and use of controlled atmosphere (CA) storages. Experimental vegetable storage of this type is being studied.

The increased use and development of bulk handling for tomatoes, apples and peaches contributed to lower costs. Containerized shipments are being developed to provide "door to door" delivery thus avoiding damage and pilferage encountered in the numerous handlings of smaller containers. Limited containerized shipments took place this fall through recently constructed facilities in Montreal. One shipping line built a boat for this purpose and is cooperating with Ontario exporters in the experimental shipment of apples to Britain.

In view of the greater availability of facilities for bulk movement of produce and the obvious advantages of this method of handling, it may be advisable for all segments of the industry, governmental and commercial, to reappraise regulations and procedures controlling interprovincial and international shipping of field run or loosely graded fruit and vegetables. This type of movement is currently allowed only if the produce meets minimum grade standards. There is a

growing feeling in the industry that grading to minimum standards accomplishes little when the product is to be regraded and packed at destination.

The Merchandising, Licensing and Arbitration Regulations covering fresh fruit and vegetables, formerly effective under the Fruit, Vegetables and Honey Act, were extensively revised and promulgated under the Canada Agricultural Products Standards Act in December 1967. The Interprovincial Trade Regulations under the Canada Agricultural Products Standards Act were amended to provide compulsory inspection in Quebec for interprovincial and international trade for the following products: apples, blueberries, carrots, lettuce, onions, potatoes and rutabagas.

Freeze-dry processing techniques were investigated for extension to more fruit and vegetables. In laboratory tests, a color comparator for the grading of tomatoes for processing was developed and proved to be five times faster than electronic equipment.

APPLES

Situation 1967-68

Apple production in 1967 was a record 1,102 million pounds, 18 per cent more than the previous year's crop. Consumption of apples in Canada has been rising slowly. About 65 per cent of production goes to the fresh market. The volume of apples for processing has been increasing annually and now accounts for roughly 35 per cent of production. In Nova Scotia, nearly 70 per cent of the crop is processed, with decreasing proportions for Ontario and British Columbia, and with Quebec processing only 15 per cent.

The major use of apples in processing has been apple juice and its production has been rising over the years. Exports of apple juice have gone up more than $4\frac{1}{2}$ times in the past 2 years compared with the average of 1961-65. Domestic consumption between 1961-65 and 1967-68 increased 32 per cent. Canned apples, including solid pack, sauce and pie filling have also increased. Apple sauce production has almost doubled from an average of 12,438,000 pounds in 1956-60 to 23,160,000 pounds in 1967-68. Domestic consumption has been rising and takes the bulk of production. Exports of canned apples, which had been increasing in recent years, declined last year and accounted for about one-sixth of canned apple products. Britain has been the main market for Canadian exports of solid pack canned apples.

Exports of fresh apples account for 15 per cent of production in Canada, although in some areas, par-

ticularly British Columbia, exports are larger. Shipments increased rather sharply during 1967-68 to 169 million pounds from 137 million pounds in the previous year. The major export markets for fresh apples are the United States and Britain. Sweden, Denmark and Ireland rank next in importance but account for only a small portion.

There was a substantial decline in the export of apples to Britain in 1966-67 and 1967-68. Canada's share of the British market for imported apples declined to 6.9 per cent compared to the previous five year average (1961-65) of about 10 per cent. Exports to Britain, from both Canada and the United States, were about forty per cent below those of 1965-66, while French exports increased five-fold and Italian sales by one-half during the same period. France has become an important supplier to Britain and has taken a growing share of the total import quota. A decrease in Britain's 1967 harvest resulted in a substantial increase in the quota for non-sterling suppliers. However, the announcement of it came too late to be of real benefit to Canadian exporters.

Canada's exports of solid pack canned apples to Britain doubled between 1965 and 1967 but those of Australia, New Zealand and Japan increased at an even greater rate. During the first six months of 1968, Canadian exports were slightly below the previous year, and Canada ranked third amongst suppliers after Japan and Italy.

Although supplies of Canadian apples were abundant during 1967-68, domestic demand was good. Wholesale to retail prices of Ontario Fancy McIntosh, at Toronto, averaged \$3.86 compared with \$3.45 per bushel during the previous year.

Production 1968

Apple production for 1968 is estimated at 909 million pounds, 18 per cent less than the record crop of 1,102 million pounds in 1967, 3 per cent less than 1966 and about the same as the five year average production of 1961-65. Early forecasts indicate a decline in all the apple producing provinces during 1968. Quebec, which had a record crop of 351 million pounds last year (with a large windfall included), will have only 260 million pounds in 1968. Nova Scotia's production will decline to 113 million pounds from 157 million pounds in 1967. Apple production in B.C. is estimated at 262 million pounds for 1968 compared with 302 million pounds last year. In Ontario, apple production is estimated at 252 million pounds compared with 267 million pounds for the previous year. New Brunswick will also show a small decline.

In the United States, the 1968 crop is expected to be about 5.4 billion pounds, equal to last year's production but 8 per cent below the average of 1962-66. The

total North American crop will be about 6.3 billion pounds compared with 6.5 billion pounds last year, or 200 million pounds less than last year. The Michigan crop is likely to be a little smaller as well as that for Washington which is estimated at 1,000 million pounds compared with 1,240 million last year. In California apple prospects are much better than the poor showing of 1967, and the crop is expected to be up two-thirds from 1967, 14 per cent above average.

Production in France for 1968 is estimated at 3.6 billion pounds, 15 per cent more than last year's 3.1 billion. In West Germany the apple crop is 3 billion pounds, down 40 per cent from last year's 5 billion pounds. Italy's production is estimated at 4.3 billion pounds, up 4.3 per cent from last year. Netherlands and Belgium show declines of 30.4 and 37.5 per cent, respectively, from last year's production. Total E.E.C. production is estimated at 12.7 billion pounds, down 18 per cent from 1967. Apple production for England and Wales was estimated at 453 million pounds, up 6 per cent from the poor crop of last year but still below average. Subsequent storm damage will likely reduce this estimate.

Outlook

It is anticipated that the lower level of apple production in North America will, probably, result in slightly higher prices compared with last year. Domestic consumption of apples in processed form, such as juice, sauce and other products, is likely to increase further.

It is expected that the smaller 1968 crop in the E.E.C. will reduce the pressure on the British market from European suppliers. Canadian exporters of both fresh and processed apples are apprehensive that the devaluation of the pound sterling may discourage British importers from buying Canadian apples this season. However, it is not possible to assess this factor until contracts are negotiated.

The disposition of fresh apples in North America looks good due to the small crop in Canada and the United States. The below average U.S. crop, especially in the State of Washington, should result in a continuation of the strong demand for apple imports from British Columbia. The smaller crop in Michigan should also result in increased sales of Canadian apples to the United States. We may still sell some apples to Scandinavia and other normal markets but sales to Britain look poor.

OTHER FRUIT

Situation

Estimated Canadian production of other fruit, with some exceptions, was smaller in 1968 than in

1967. Total cherry production was down by about a third, from 49.4 million pounds to about 33.8 million pounds. Sour cherry production, which had shown a marked increase in 1967 in Ontario, declined by 35 per cent in 1968. A decline in blueberry production is likely, although estimates for British Columbia, Ontario and Quebec have not yet been received. The production of plums and prunes, however, is estimated 15 per cent higher this year. Peach production for Ontario was estimated at 194.6 million pounds, which is 54 per cent higher than last year's low production. Apricot production in British Columbia was estimated at 8.5 million pounds, an increase of more than 28 per cent.

The United States demand for fresh blueberries could not be satisfied because of the short crop in Quebec and the Maritimes. Imports of most fresh fruit remained relatively constant, however, imports of fresh pears, peaches and apricots declined rather substantially during 1967-68. The demand for fresh fruit on the domestic market remained at fairly constant levels. The smaller fruit crop tended to exert some upward pressure on strong prices.

Outlook

The small peach crop in British Columbia and a heavy demand by the fresh market on a below average Ontario crop will result in a small domestic pack. Domestic supplies of canned peaches and pears have not been sufficient to meet requirements, so imports are likely to remain about the same as previous years.

The British market is providing a growing export outlet for canned sour cherries. With the reduced crop of this variety in Ontario, and below-average production in the United States, despite an increase over the poor 1967 crop, it should be possible this season to move all exportable supplies of canned cherries to Britain, West Germany and other markets.

POTATOES

Situation 1967-68

The 1967 potato crop was 4,600 million pounds, a reduction of 14.6 per cent compared with the previous year's crop and 1.5 per cent above the 1961-65 average. The main outlet of the crop was the domestic fresh market, representing about 53 per cent of the total. Although no final information for 1967-68 is available, it is estimated that 16 per cent of the crop went to processors. Exports, of which almost 72 per cent consisted of certified seed potatoes, were 5.4 per cent of the crop. Seed for the 1968 crop took 6.2 per cent and shrinkage the balance. Consumption of fresh potatoes dropped slightly but remained

above the five year average. The provincial share of the 1967 potato crop was as follows: P.E.I. 20.5 per cent; Nova Scotia 1.4; New Brunswick 26.9; Quebec 16.9; Ontario 15.7; Manitoba 6.2; Saskatchewan 1.2; Alberta 6.8 and British Columbia 4.4 per cent. Comparing the 1967 crop with the 1961-65 average, Ontario and Quebec's shares decreased by 2.8 and 5.6 per cent, respectively, while P.E.I., New Brunswick and Manitoba increased by 3.5, 3.2 and 1.6 per cent.

Data on the pack of processed potato products are no longer available. Previous trends and observed changes in demand for processed potatoes suggest an increased production of canned, frozen, chips and pre-peeled and cut potatoes.

The volume of potato imports during 1967-68 crop year amounted to 226.6 million pounds, the second highest since 1956. On the other hand, the export of both table stock and certified seed potatoes was one of the lowest on record. This substantial change was largely a consequence of the exceptionally large crop in the United States.

Reduction in the crop resulted in some increase in market prices from the previous year but prices remained below the 1961-65 average. New Brunswick potatoes on the Montreal market averaged \$2.56 per hundred pounds for the 1967 crop, compared with \$2.93 average for the 1961-65 period. P.E.I. potatoes in the Toronto market averaged \$3.18 while the 1961-65 average was \$3.44. The then current level of returns to producers was at a ten year low. Preliminary estimates indicated the average returns to potato growers were \$1.71 per hundred pounds, compared with \$1.98 for the 1958-67 average.

Federal assistance in the form of acreage payments was given all growers by action of the Agricultural Stabilization Board. A payment of \$25.00 per eligible acre up to a maximum of \$400.00 per grower based on the 1967 crop, was made.

The large 1967 United States crop resulted in low prices in that country which had a similar effect on Canadian prices. However, in the winter of 1968 the United States Department of Agriculture embarked on a support program which accounted for 1,470 million pounds. This action eventually resulted in a firming of prices in both Canada and the United States.

During the past season, the greatest acreage of certified seed potatoes was grown since the inception of the scheme in 1915. Some 95,000 acres, slightly higher than last year, were entered for inspection. New regulations will convert the seed potato certification scheme into an elite seed potato improvement and certification program.

Exports of canned whole potatoes to Britain exceeded one million pounds weight in the first six

months of 1968, which ranked Canada as third leading supplier to that market. Italy is the principal competitor.

Production 1968

Current estimates indicate a reduction of 2 per cent in the 1968 potato crop compared with last year. Both a reduction in acreage and lower yields contributed to this drop in production. The planted acreage for 1968 is estimated at 4.4 per cent above 1961-65 average and production is forecast at 4,580 million pounds, 0.4 per cent below the 1961-65 average. Early forecasts indicate reduced crops in the provinces of P.E.I., Nova Scotia, New Brunswick, Manitoba and Saskatchewan. Larger crops than last year are expected in Quebec, Ontario, Alberta and British Columbia. The largest drop in production is anticipated in New Brunswick, down 21.5 per cent from last year. Quebec is expecting about 15 per cent above the 1967 crop and 0.5 per cent above the 1961-65 average. This increase is a consequence of an expected yield per acre of 131.2 hundred pounds or 17 per cent larger than in 1967.

United States production of fall potatoes is forecast at 21,050 million pounds, 9 per cent below the 1967 crop. Acreage and expected yield per acre are also below a year earlier. In the eastern States, the reduction in the fall crop is estimated to be 8 per cent, while in the central and western States, declines of 4.3 and 11.6 per cent respectively are expected. The situation in Washington State however was different. As a result of the intense development of the Columbia River Basin, production rose from 590 million pounds in 1963 to 1,550 in 1968, or 149 per cent of the 1963-67 average. Fall production was 4 per cent greater than the previous year. The practice of stripping the larger size potatoes from the U.S. one Size A grade permits them to be sold at premium prices as "bakers" and the remaining smaller potatoes, "strippers", to be sold at much lower prices. These are potatoes that meet minimum Canadian import requirements. The increasing import of these "stripper" potatoes at low prices into Western Canada had a very depressing effect on sales of Canadian potatoes. By mid-September a value for duty was imposed on potatoes entering Western Canada.

Outlook

The expected reduction in the volume of the crop in North America will most likely lead to a further increase in market prices for fresh potatoes in Canada. Based upon the reduced September forecast for the fall potato crop in the United States, an increase in shipments of table stock to that country can be ex-

pected. It is not known where export opportunities for Canadian table potatoes may appear in overseas countries, as a result of any decrease in local crops which may develop in those countries.

The expected reduction in this year's United States fall crop should also create a larger market in the United States for Canadian seed potatoes than existed last season. Exports to Argentina, Venezuela, Cuba, Greece, Italy and the West Indies are expected to be comparable with those of the past season, but the exchange problems being experienced by Uruguay may interfere with sales to that market. A seed potato mission from Roumania was sponsored by the Federal Government in 1968. It is possible that Roumania will be added to the list of newly developed export markets for certified seed.

OTHER VEGETABLES

Situation 1967-68

There were no 1968 data available for the vegetable crop for fresh table use. Estimates of commercial acreage for vegetables planted in 1967 however showed an increase of 4 per cent from the previous year. All the provinces except Alberta showed an upward trend. The largest increase was for fresh beans, 99.3 per cent more than in 1966. The production of fresh beans, however, was lower than in 1966, the increased acres being offset by a sharp drop in yield. Increases in production over 1966 were: cauliflower 14.1 per cent; cucumber 15.5; lettuce 17.1; tomatoes for processing 15.9; tomatoes for the fresh market 20.2; and turnips 12.0 per cent.

The contracted acreage of processing beans and tomatoes for 1968 was reduced. The acreage for canning beans declined 28.6 per cent from 1967 while that of beans for freezing dropped 21.4 per cent. The 1968 acreage for processing tomatoes was 23,140 acres or 9.8 per cent lower than in 1967. The acreage of processing spinach and Brussels sprouts also dropped slightly. The acreage of the remainder of vegetables planted for processing showed an increase over 1967.

The production of canned tomatoes and tomato juice in 1967 increased considerably over the previous year. There were also increases in canned mushrooms, green beans and frozen vegetables. Other processed vegetables showed decreases.

In 1967-68 there was an increase in the imports of all vegetables except cucumbers, tomatoes, canned corn, canned tomatoes, tomato juice and tomato paste, pulp and puree. Commodities showing upward trends in exports were tomatoes, rutabagas, canned corn, canned peas and frozen vegetables. Both total

exports and exports to Britain of dry onions declined last season from the previous year. Exports of rutabagas to the United States increased substantially. The statistics of the movement of frozen vegetables other than french fry potatoes to the dominant market, Britain, in the first half of 1968, suggest that frozen peas have been most affected by devaluation. This was expected by Canadian exporters on the grounds that British domestic production of this vegetable can be increased fairly readily. Exports of canned whole kernel corn and canned green beans to Britain continue to grow. Canned tomato juice exports to Britain showed an increase in the first half of 1968. To date, we have no statistical evidence that sterling devaluation in Britain seriously affected the volume of processed exports, although processors may have had to adjust prices. For 1968, a good crop of onions and carrots is expected and, at least the same level of production for all the other vegetables.

Outlook

Recent reports of crop conditions in Britain point to a substantial short fall in the pea crop, due to weather conditions which could result in increased exports.

The large 1968 Canadian crop of quality onions and carrots will require increased efforts to export surplus quantities. Reduced domestic prices for these products are already in evidence and will likely continue into 1969. The market for canned wax beans in West Germany will likely decline because of increasing production within the E.E.C. and the elimination of internal tariffs.

HONEY

Situation 1967-68

The 1967 honey crop was 45.7 million pounds, about 2 per cent above the previous year and 17 per cent above the 1961-65 average. Total supplies were about the same as for 1966-67 but 21 per cent greater than the 1961-65 average, reflecting the steadily increasing carry over. Although imports were half of those for 1966-67 there was also a 26 per cent drop in exports which resulted in a slight decrease in domestic disappearance of 4.8 per cent and about 3.9 million pounds or a 28 per cent increase in stocks at the year's end, June 30th. Exports to the United Kingdom totaled 3.8 million pounds as compared with 6.5 millions the previous year. Exports to the United States were nearly 1.2 million pounds for the same period, an increase of more than a million pounds.

Wholesale prices on the domestic market remained steady over the past two years. Because of a poor crop last season, Argentine honey was no longer avail-

able at low prices. Nevertheless, world prices were still influenced by supplies of low priced honey offered by Mainland China, Mexico and Australia.

The 1968 production, based on provincial crop reports, was expected to be about 35 million pounds or 25 per cent less than for 1967. Colonies were down, estimated at 415,000, about the same level as in 1965 with 10,000 fewer in Ontario and 20,000 fewer in Alberta. Estimated yields are greater for Ontario, but the prairie provinces' yield was expected to be down one third from 1967.

Early indications were that the 1968 United States crop was less than that for 1967, which in turn was about 12 per cent below average.

Outlook

If exports and imports are maintained at the 1961-65 level and domestic consumption continues at recent rates, the record high stocks of Canadian honey which prevailed in early 1968 should be greatly reduced by mid 1969. On this basis, prices should remain at present levels or possibly rise.

MAPLE PRODUCTS

Situation 1967-68

The 1968 production of maple products expressed as syrup was about 2.7 million gallons, 8 per cent above 1967 and 10 per cent above the 1961-65 average of 2.5 million gallons. The bulk of the crop, about 90 per cent, was produced in Quebec where syrup production in 1968 was 9 per cent above last year. Exports accounted for nearly 60 per cent of production in 1967, practically all of which went to the United States in the form of syrup, sugar and taffy. Last year, although more maple syrup was exported, a decline in exports of maple sugar offset the gain. Stocks were reported to be high.

Maple syrup production in the United States for 1968 was estimated at 979,000 gallons equal to the record low of the previous year and 29 per cent less than the 1961-65 average of 1.4 million gallons. Despite lower production in the past two years; stocks of maple products at the industrial user or blender level in the United States were reported high.

Outlook

Prospects for some increase in export sales are promising. Two consecutive small United States maple crops should reduce stock levels. A consequence of this should be a strengthening of prices, however, a lessening demand due to synthetic products and declining industrial use may continue to show stock reduction.

TABLE 1—FRESH FRUIT AND VEGETABLES: PRODUCTION AND FARM VALUE, 1956-60 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968 Estimate
APPLES					
Production.....thousand pounds	679,410	918,180	946,890	1,101,825	917,235
Farm Value.....thousand dollars	17,851	28,953	31,717		
APRICOTS					
Production.....thousand pounds	10,800	10,650	13,950	6,600	8,500
Farm Value.....thousand dollars	460	487	536		
BLUEBERRIES					
Production.....thousand pounds	17,522	19,850	37,509	31,024	12,770
Farm Value.....thousand dollars	2,327	2,890	6,674		
CANTELOUPES					
Production.....thousand pounds	5,850	6,090	3,469	3,438	
Farm Value.....thousand dollars	248	301	187		
CHERRIES (SWEET AND SOUR)					
Production.....thousand pounds	26,900	40,650	33,850	49,350	33,800
Farm Value.....thousand dollars	3,032	4,753	5,296		
CRANBERRIES					
Production.....thousand pounds	477	982	1,797		
Farm Value.....thousand dollars	11 ^a	152	287		
GRAPES					
Production.....thousand pounds	90,672	106,015	122,536	138,178	128,320
Farm Value.....thousand dollars	3,990	5,252	6,333		
PEACHES					
Production.....thousand pounds	125,200	121,700	104,250	82,300	104,600
Farm Value.....thousand dollars	5,589	6,610	7,434		
PEARS					
Production.....thousand pounds	68,650	79,500	103,100	87,350	86,150
Farm Value.....thousand dollars	2,731	3,435	4,240		
PLUMS AND PRUNES					
Production.....thousand pounds	28,350	29,400	29,550	23,500	27,550
Farm Value.....thousand dollars	1,006	1,220	1,491		
RASPBERRIES					
Production.....thousand pounds	13,486	15,071	17,388	17,971	13,692
Farm Value.....thousand dollars	2,795	3,563	3,947		
STRAWBERRIES					
Production.....thousand pounds	26,754	30,198	38,369	43,436	35,864
Farm Value.....thousand dollars	4,725	6,115	8,809		
TOTAL VALUE					
Fruit.....thousand dollars	44,765	63,731	76,951		
ASPARAGUS					
Production.....thousand pounds	7,447	6,473	5,492	5,081	
Farm Value.....thousand dollars	1,353 ^b	1,298	1,236	1,223	
WAX AND GREEN BEANS, PROCESSING					
Production.....thousand pounds	42,063	68,609	95,480	101,900	
Farm Value.....thousand dollars	2,133 ^c	2,791	1,170	1,810	
WAX AND GREEN BEANS, FRESH					
Production.....thousand pounds	4,559	9,840	10,729	9,521	
Farm Value.....thousand dollars	322 ^b	778	999	865	
BEETS					
Production.....thousand pounds	51,728	51,997	46,443	41,329	
Farm Value.....thousand dollars	1,164 ^b	1,101	959	958	
CABBAGE					
Production.....thousand pounds	127,714	134,278	137,281	135,159	
Farm Value.....thousand dollars	2,809 ^b	2,849	3,705	3,595	
CARROTS					
Production.....thousand pounds	222,321	322,557	420,918	355,060	
Farm Value.....thousand dollars	5,683 ^b	6,559	6,029	9,990	
CAULIFLOWER					
Production.....thousand pounds	26,355	33,812	32,658	37,281	
Farm Value.....thousand dollars	1,442 ^b	1,703	1,981	2,320	
CELERY					
Production.....thousand pounds	43,608	43,344	38,790	36,618	
Farm Value.....thousand dollars	1,302 ^b	1,159	1,637	1,482	

TABLE 1—FRESH FRUIT AND VEGETABLES: PRODUCTION AND FARM VALUE, 1956-60 TO 1968 (Continued)

	Average 1956-60	Average 1961-65	1966	1967 Preliminary	1968
CORN, PROCESSING					
Production.....thousand pounds	259,026	309,967	384,160	362,160	
Farm Value.....thousand dollars	3,168 ^b	3,876	4,091	4,340	
CORN, TABLE					
Production.....thousand pounds	64,850	68,613	72,306	77,155	
Farm Value.....thousand dollars	2,518	2,689	2,739	2,846	
CUCUMBERS					
Production.....thousand pounds	44,872 ^b	71,183	104,018	120,194	
Farm Value.....thousand dollars	1,666 ^b	2,716	4,740	6,090	
LETTUCE					
Production.....thousand pounds	59,088	57,564	48,219	56,462	
Farm Value.....thousand dollars	3,031 ^b	2,577	3,341	3,780	
MUSHROOMS					
Production.....thousand pounds	n.a.	18,630 ^a	19,059	23,549	
Farm Value.....thousand dollars	n.a.	7,900 ^a	7,945	10,481	
ONIONS					
Production.....thousand pounds	128,264	228,773	206,156	224,627	
Farm Value.....thousand dollars	3,761 ^b	5,692	8,165	7,006	
PARSNIPS					
Production.....thousand pounds	11,031 ^b	12,654	11,082	8,064	
Farm Value.....thousand dollars	431 ^b	495	504	382	
PEAS					
Production.....thousand pounds	105,825	128,156	125,760	135,880	
Farm Value.....thousand dollars	5,140 ^b	5,694	3,783	4,023	
POTATOES					
Production.....thousand pounds	40,798	46,033	54,679	46,743	45,857
Farm Value.....thousand dollars	80,302	93,949	91,731		
SPINACH					
Production.....thousand pounds	12,448	11,527	11,164	6,544	
Farm Value.....thousand dollars	645 ^b	526	606	373	
TOMATOES, PROCESSING					
Production.....thousand pounds	627,241 ^c	675,880	571,460	662,460	
Farm Value.....thousand dollars	11,120 ^c	12,779	12,414	15,610	
TOMATOES, FRESH					
Production.....thousand pounds	122,335	128,082	129,825	158,836	
Farm Value.....thousand dollars	5,867 ^b	6,158	6,798	8,005	
TURNIPS					
Production.....thousand pounds	213,778 ^d	233,330	214,616	240,468	
Farm Value.....thousand dollars	2,990 ^d	3,492	5,358	4,185	
TOTAL VALUE					
Vegetables.....thousand dollars	56,072 ^d	64,932	70,255	78,883	
TOTAL VALUE FRUIT AND VEGETABLES					
thousand dollars	100,837	128,663	147,206		

^a One year only, 1958.^b 1958-60 average.^c 1957-60 average.^d 1959-60 average.^e 1964-65 average.

TABLE 2—APPLES: PRODUCTION IN CANADA BY PROVINCES, 1956-60 TO 1968

	1956-60	1961-65	1966	1967	1968 Estimate
thousand pounds					
Canada.....	679,410	918,180	946,890	1,101,825	917,235
Nova Scotia.....	99,765	128,925	133,290	157,500	121,500
New Brunswick.....	17,775	21,375	20,250	22,500	20,250
Quebec.....	152,280	232,515	184,500	351,585	260,775
Ontario.....	173,655	251,685	266,985	267,390	252,630
British Columbia.....	235,935	283,680	341,865	302,850	262,080

TABLE 3—FRESH FRUIT: SUPPLY AND DISPOSITION, CANADA, 1956-60 TO 1968-69

	Average 1956-60	Average 1961-65	1966-67	1967-68	1968-69 Estimate
thousand pounds					
APPLES					
Production.....	679,410	918,180	946,890	1,101,825	917,235
Imports.....	51,885	54,270	49,725	66,419	
Total supply.....	731,295	972,450	996,615	1,168,244	
Fresh exports.....	101,970	133,605	137,025	169,143	
Processed.....	197,010	295,020	357,120		
Waste.....	99,090	127,350	120,420		
Available for domestic use.....	333,225	416,475	382,050		
Net trade.....	+ 50,085	+ 79,335	+ 87,300	+102,724	
APRICOTS					
Production ^a	10,800	10,650	13,950	6,600	8,500
Imports.....	3,550	3,800	3,950	1,792	
Total supply.....	14,350	14,450	17,900	8,392	
Fresh exports.....	—	100	—		
Processed.....	5,100	4,100	5,900		
Available for domestic use.....	9,250	10,250	12,000		
Net trade.....	-3,550	-3,700	-3,950		
BLUEBERRIES					
Production.....	17,522	19,850	37,509	31,024	12,770 ^a
Imports.....	—	1,319	1,766	1,800	
Total supply.....	17,522	21,169	39,275	32,824	
Fresh exports.....	7,909	6,332	15,004	8,344	
Processed.....	5,045	7,786	16,066		
Available for domestic use.....	4,568	7,051	8,205		
Net trade.....	+ 7,909	+ 5,013	+13,238	+ 6,544	
CANTELOUPES^b					
Production.....	5,850	6,090	3,469	3,438	
Imports.....	33,138	38,106	37,983	47,914	
Total supply.....	38,988	44,196	41,452	51,352	
Fresh exports.....	450	280	200		
Available for domestic use.....	38,538	43,916	41,252		
Net trade.....	-32,688	-37,826	-37,783		
CHERRIES					
Production.....	26,900	40,650	33,850	49,350	33,800
Imports.....	2,100	3,250	4,900	3,591	
Total supply.....	29,000	43,900	38,750	52,941	
Fresh exports.....	850	2,250	2,000		
Processed.....	13,250	22,850	19,600		
Available for domestic use.....	14,900	18,800	17,150		
Net trade.....	- 1,250	- 1,000	- 2,900		
CRANBERRIES					
Production.....	477	982	1,797		
Imports.....	4,632	4,419	3,391	2,512	
Total supply.....	5,109	5,401	5,188		
Fresh exports.....	—	105	—		
Processed.....	n.a.	n.a.	n.a.		
Available for domestic use.....	5,109	5,296	5,188		
Net trade.....	- 4,632	- 4,314	- 3,391		
GRAPES					
Production.....	90,672	106,015	122,536	138,178	128,320
Imports.....	145,877	203,343	262,384	259,895	
Total supply.....	236,549	309,358	384,920	398,073	
Fresh exports.....	10,908	13,299	14,966	23,158	
Processed.....	60,696	72,976	91,428		
Available for domestic use.....	164,945	223,083	278,526		
Net trade.....	-134,969	-190,044	-247,418	-236,737	

TABLE 3—FRESH FRUIT: SUPPLY AND DISPOSITION, CANADA, 1956-60 TO 1968-69 (Continued)

	Average 1956-60	Average 1961-65	1966-67	1967-68	1968-69 Estimate
thousand pounds					
PEACHES					
Production.....	125,200	121,700	104,250	82,300	104,600
Imports.....	33,400	33,850	34,000	23,932	
Total supply.....	158,600	155,550	138,250	106,232	
Fresh exports.....	700	350	400		
Processed.....	57,250	56,450	38,800		
Available for domestic use.....	100,650	98,750	99,050		
Net trade.....	-32,700	-33,500	-33,600		
PEARS					
Production.....	68,650	79,500	103,100	87,350	86,150
Imports.....	27,700	25,550	33,700	20,455	
Total supply.....	96,350	105,050	136,800	107,805	
Fresh exports.....	1,000	5,150	6,100	8,750	
Processed.....	36,000	41,750	49,700		
Available for domestic use.....	59,350	58,150	81,000		
Net trade.....	-26,700	-20,400	-27,600	-11,715	
PLUMS AND PRUNES					
Production.....	28,350	29,400	29,550	23,500	27,550
Imports.....	17,050	17,700	19,100	20,391	
Total supply.....	45,400	47,100	48,650	43,891	
Exports.....	300	300	50		
Processed.....	7,900	7,250	10,050		
Available for domestic use.....	37,200	39,550	38,550		
Net trade.....	-16,750	-17,400	-19,050		
RASPBERRIES					
Production.....	13,486	15,071	17,388	17,971	13,692
Imports.....	1,143	119	147	240	
Total supply.....	14,629	15,190	17,535	18,211	
Fresh exports.....	—	2,189	4,969	4,440	
Processed.....	8,584	11,095	14,898		
Available for domestic use.....	6,045	1,906	—	2,332	
Net trade.....	-1,143	+ 2,070	+ 4,822	+ 4,200	
STRAWBERRIES					
Production.....	26,754	30,198	38,369	43,436	35,864
Imports.....	18,697	20,712	14,920	15,245	
Total supply.....	45,451	50,910	53,289	58,681	
Fresh exports.....	135	61	—	—	
Processed.....	12,916	13,208	18,021		
Available for domestic use.....	32,400	37,641	35,268		
Net trade.....	-18,562	-20,651	-14,920	-15,245	

^a British Columbia only.

^b Ontario only.

^c Excluding British Columbia, Ontario and Quebec.

TABLE 4—BLUEBERRIES: PRODUCTION AND EXPORTS, CANADA, 1956-60 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968 Estimate
thousand pounds					
Canada (excluding Ontario).....	17,522	19,850	37,509	31,024	12,770 ^a
Newfoundland.....	1,509	1,777	2,361	1,581	2,750
Prince Edward Island.....	297	258	550	710	520
Nova Scotia.....	4,484	6,440	7,600	11,700	5,000
New Brunswick.....	3,380	3,600	7,000	7,000	4,500
Quebec.....	6,287	5,307	16,550	5,461	—
British Columbia ^b	1,565	2,468	3,448	4,572	—
Exports (fresh).....	7,909	6,332	15,004	8,344	—
Exports (frozen).....	2,371	5,718	4,432	9,861	—
Total exports.....	10,280	12,050	19,436	18,205	—

^a Excluding Quebec and British Columbia.

^b Cultivated highbush blueberries.

TABLE 5—CANNED FRUIT: SUPPLY AND DISPOSITION, CANADA, 1956-60 TO 1968-69

	Average 1956-60	Average 1961-65	1966-67	1967-68	1968-69
thousand pounds					
APPLES (SOLID PACK AND PIE FILLING)					
Beginning stocks.....	10,211	11,037	10,431	15,370	10,190
Production.....	20,532	28,558	35,028	33,477	
Total supply.....	30,743	39,595	45,459	48,847	
Exports.....	1,384	7,290	10,942	9,715	
Ending stocks.....	10,371	10,925	15,370	10,190	
Apparent domestic disappearance..	18,988	21,380	19,147	28,942	
APPLE JUICE					
Beginning stocks.....	22,464	32,021	59,490	67,556	49,528
Production.....	72,049	129,802	147,639	156,062	
Total supply.....	94,513	161,823	207,129	223,618	
Exports.....	2,770	3,957	18,994	18,242	
Ending stocks.....	20,986	39,883	67,556	49,528	
Apparent domestic disappearance..	70,757	117,983	120,579	155,848	
APPLE SAUCE					
Beginning stocks.....	4,924	6,566	13,102	10,179	8,365
Production.....	12,438	19,535	19,421	23,160	
Total supply.....	17,362	26,101	32,523	33,339	
Exports.....	—	—	—	—	
Ending stocks.....	4,679	8,503	10,179	8,365	
Apparent domestic disappearance..	12,683	17,598	22,344	24,974	
APRICOTS					
Beginning stocks.....	3,641	2,019	1,402	2,594	663
Production.....	5,273	5,951	8,128	2,476	
Imports.....	5,185	5,465	5,530	7,635	
Total supply.....	14,099	13,435	15,060	12,705	
Ending stocks.....	3,447	1,765	2,594	663	
Apparent domestic disappearance..	10,652	11,670	12,466	12,042	
CHERRIES (SWEET AND SOUR)					
Beginning stocks.....	2,149	1,681	624	1,904	1,866
Production.....	7,672	11,157	12,320	13,713	
Total supply.....	9,821	12,838	12,944	15,617	
Ending stocks.....	1,610	1,580	1,904	1,866	
Apparent domestic disappearance..	8,211	11,258	11,040	13,751	
PEARS					
Beginning stocks.....	15,410	12,882	10,878	18,456	10,646
Production.....	30,718	31,953	38,503	25,713	
Imports.....	4,185	6,926	11,167	7,530	
Total supply.....	50,313	51,761	60,548	51,699	
Exports.....	1,114	1,977	544	2,120	
Ending stocks.....	15,828	10,837	18,456	10,646	
Apparent domestic disappearance..	33,371	38,947	41,548	38,933	
PEACHES					
Beginning stocks.....	19,599	15,065	5,288	8,443	2,220
Production.....	50,755	43,494	29,475	15,708	
Imports.....	20,118	32,526	56,985	57,730	
Total supply.....	90,472	91,085	91,748	81,881	
Exports.....	1,245	451	81	60	
Ending stocks.....	19,578	12,040	8,443	2,220	
Apparent domestic disappearance..	69,649	78,594	83,224	79,601	
PLUMS					
Beginning stocks.....	4,297	3,047	1,315	4,924	4,070
Production.....	8,605	8,659	11,987	9,040	
Total supply.....	12,902	11,706	13,302	13,964	
Ending stocks.....	3,176	2,979	4,924	4,070	
Apparent domestic disappearance..	9,726	8,727	8,378	9,894	

TABLE 5—CANNED FRUIT: SUPPLY AND DISPOSITION, CANADA, 1956-60 TO 1968-69 (Continued)

	Average 1956-60	Average 1961-65	1966-67	1967-68	1968-69
thousand pounds					
STRAWBERRIES					
Beginning stocks.....	1,255	801	350	682	591
Production.....	2,887	2,850	3,453	2,797	
Total supply.....	4,142	3,651	3,803	3,479	
Ending stocks.....	1,034	688	682	591	
Apparent domestic disappearance..	3,108	2,963	3,121	2,888	
RASPBERRIES					
Beginning stocks.....	633	406	526	378	335
Production.....	2,964	3,323	2,770	4,686	
Total supply.....	3,597	3,729	3,296	5,064	
Ending stocks.....	599	395	378	335	
Apparent domestic disappearance..	2,998	3,334	2,918	4,729	

TABLE 6—POTATOES AND VEGETABLES: ACREAGE IN CANADA BY PROVINCE, 1956-60 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968 Estimate
thousand acres					
POTATOES					
Canada.....	300.5	290.4	318.9	303.8	303.3
Prince Edward Island.....	44.5	42.0	52.1	51.0	53.0
Nova Scotia.....	9.3	6.5	6.2	5.0	5.1
New Brunswick.....	46.6	53.6	64.9	62.0	61.0
Quebec.....	88.2	73.2	74.7	71.0	70.0
Ontario.....	52.6	51.1	52.1	48.0	45.0
Manitoba.....	16.0	21.3	24.5	26.5	26.5
Saskatchewan.....	13.7	10.5	8.5	8.0	7.5
Alberta.....	18.7	21.7	25.4	22.4	24.4
British Columbia.....	10.9	10.5	10.5	9.9	10.8
acres					
VEGETABLES					
Canada.....	205,880	232,122	229,102	238,341	
Prince Edward Island.....	n.a.	54	228	221	
Nova Scotia.....	3,772	4,036	11,800 ^a	12,090 ^a	
New Brunswick.....	2,510	8,136	1,315 ^b	1,300 ^b	
Quebec.....	59,468	75,416	73,910	79,470	
Ontario.....	107,276	109,200	110,650	116,474	
Manitoba.....	3,686	3,730	2,790	3,230	
Alberta.....	13,160	15,842	13,580	10,040	
British Columbia.....	16,008	15,708	14,829	15,516	

^a Includes Maritime green peas and green and wax beans for processing.^b Maritime green peas and beans for processing are excluded from previous years.TABLE 7—POTATOES: PRODUCTION IN CANADA BY PROVINCE, 1956-60 TO 1968-69
(CROP YEAR JULY 1 TO JUNE 30)

	Average 1956-60	Average 1961-65	1966-67	1967-68	1968-69 Estimate
hundred thousand pounds					
Canada.....	40,798	46,033	54,679	46,743	45,857
Prince Edward Island.....	7,555	7,820	10,776	9,607	9,010
Nova Scotia.....	1,284	877	973	693	643
New Brunswick.....	8,540	10,914	14,450	12,585	9,882
Quebec.....	9,700	9,132	8,770	7,938	9,184
Ontario.....	7,658	9,824	10,003	7,344	8,438
Manitoba.....	1,336	2,117	3,062	2,900	2,700
Saskatchewan.....	852	718	619	576	500
Alberta.....	1,831	2,655	3,907	3,200	3,400
British Columbia.....	2,042	1,976	2,119	1,900	2,100

TABLE 8—FRESH VEGETABLES: SUPPLY AND DISPOSITION, CANADA, 1956-60 TO 1968-69

	Average 1956-60	Average 1961-65	1966-67	1967-68	1968-69 Estimate
thousand pounds					
ASPARAGUS					
Production.....	7,447	6,473	5,492	5,081	
Imports.....	5,326	5,975	7,431	9,314	
Total supply.....	12,773	12,448	12,923	14,395	
Fresh exports.....	—	—	—	—	
Available for domestic use.....	12,773	12,448	12,923	14,395	
Processed.....	4,255	4,099	3,429	3,378	
Available for fresh use.....	8,518	8,349	9,494	11,017	
Net trade.....	- 5,326	- 5,975	- 7,431	- 9,314	
BEETS					
Production.....	51,728	51,997	46,443	41,329	
Imports.....	4,294	2,069	n.a.	n.a.	
Total supply.....	56,022	54,066	46,443	41,329	
Fresh exports.....	—	—	—	—	
Available for domestic use.....	56,022	54,066	46,443	41,329	
Processed.....	18,775	23,048	22,000	24,000	
Available for fresh use.....	37,247	31,018	24,443	17,329	
Net trade.....	- 4,294	- 2,069	—	—	
CABBAGE					
Production.....	127,714	134,278	137,281	135,159	
Imports.....	70,658	67,685	81,017	87,091	
Total supply.....	198,372	201,963	218,298	222,250	
Fresh exports.....	—	—	—	—	
Available for domestic use.....	198,372	201,963	218,298	222,250	
Processed.....	14,048	13,110	14,000	14,000	
Available for fresh use.....	184,324	188,853	204,298	208,250	
Net trade.....	-70,658	-67,685	-81,017	-87,091	
CARROTS					
Production.....	222,321	322,557	420,918	355,060	
Imports.....	79,351	78,235	72,388	89,184	
Total supply.....	301,672	400,792	493,306	444,244	
Fresh exports.....	—	41,370	57,437	45,501	
Available for domestic use.....	301,672	359,422	435,869	398,743	
Processed.....	39,684	55,458	66,000	52,000	
Available for fresh use.....	261,988	303,964	369,869	346,743	
Net trade.....	-79,351	-36,865	-14,951	-43,683	
CAULIFLOWER					
Production.....	26,355	33,812	32,658	37,281	
Imports.....	18,455	12,966	11,908	12,206	
Total supply.....	44,810	46,778	44,566	49,487	
Fresh exports.....	—	—	—	—	
Available for domestic use.....	44,810	46,778	44,566	49,487	
Processed.....	3,837	5,147	6,762	8,514	
Available for fresh use.....	41,073	41,631	37,804	40,973	
Net trade.....	-18,455	-12,966	-11,908	-12,206	
CELERY					
Production.....	43,608	43,344	38,790	36,618	
Imports.....	100,848	102,616	113,441	122,400	
Total supply.....	144,456	145,960	152,231	159,018	
Fresh exports.....	—	—	—	—	
Available for fresh use.....	144,456	145,960	152,231	159,018	
Processed.....	7,104	6,347	5,174	5,467	
Available for fresh use.....	137,352	139,613	147,057	153,551	
Net trade.....	-100,848	-102,616	-113,441	-122,400	

TABLE 8—FRESH VEGETABLES: SUPPLY AND DISPOSITION, CANADA, 1956-60 TO 1968-69 (Continued)

	Average 1956-60	Average 1961-65	1966-67	1967-68	1968-69
thousand pounds					
CORN					
Production.....	64,850	68,613	72,306	77,155	
Imports.....	—	19,110	19,536	19,932	
Total supply.....	64,850	87,723	91,842	97,087	
Fresh exports.....	—	—	—	—	
Available for domestic use.....	64,850	87,723	91,842	97,087	
Net trade.....	—	-19,110	-19,536	-19,932	
CUCUMBERS					
Production					
Open field.....	44,872 ^a	71,183	104,018	120,194	
Hot house.....	10,066 ^b				
Total.....	54,938				
Imports.....	23,803	27,525	43,681	35,467	
Total supply.....	78,741				
Fresh exports.....	—	—	—	—	
Available for domestic use.....	78,741				
Processed.....	43,127	56,083	86,000	98,000	
Available for fresh use.....	35,614				
Net trade.....	-23,803	-27,525	-43,681	-35,467	
LETTUCE					
Production.....	59,088	57,564	48,219	56,462	
Imports.....	152,586	196,211	226,359	258,495	
Total supply.....	211,674	253,775	274,578	314,957	
Fresh exports.....	—	1,667 ^c	—	—	
Available for domestic use.....	211,674	252,108	274,578	314,957	
Net trade.....	-152,586	-194,544	-226,359	-258,495	
MUSHROOMS					
Production.....	n.a.	18,630 ^d	19,059	23,549	
Imports.....	825	1,198	2,401	2,573	
Total supply.....	825	19,828	21,460	26,122	
Fresh exports.....	—	—	—	—	
Available for domestic use.....	825	19,828	21,460	26,122	
Processed.....	5,865	8,047	11,910	12,772	
Available for fresh use.....	n.a.	11,781	9,550	13,350	
Net trade.....	- 825	- 1,198	- 2,401	- 2,573	
ONIONS					
Production.....	128,264	228,773	206,156	224,627	
Imports.....	77,792	60,333	79,504	86,508	
Total supply.....	206,056	289,106	285,660	311,135	
Fresh exports.....	9,510	51,056	44,406	26,235	
Available for domestic use.....	196,546	238,050	241,254	284,900	
Processed.....	7,928	9,032	8,196	6,655	
Available for fresh use.....	188,618	229,018	233,058	278,245	
Net trade.....	-68,282	- 9,277	-35,098	-60,273	
hundred thousand pounds					
POTATOES					
Production.....	40,798	46,033	54,679	46,743	45,857
Imports.....	2,001	1,589	1,520	2,266	
Total supply.....	42,799	47,622	56,199	49,009	
Used for seed the following year...	2,871	2,813	2,916	2,912	
Processed.....	2,313	4,864	7,891	7,340	
Exports					
Table potatoes.....	943	1,646	1,662	715	
Certified seed.....	1,681	2,238	3,081	1,823	
Shrinkage (20 per cent of the crop)	8,160	9,207	10,936	8,886	
Available for fresh use.....	26,831	26,854	29,713	27,333	

TABLE 8—FRESH VEGETABLES: SUPPLY AND DISPOSITION, CANADA, 1956-60 TO 1968-69 (Continued)

	Average 1956-60	Average 1961-65	1966-67	1967-68	1968-69
thousand pounds					
SPINACH					
Production.....	12,448	11,527	11,164	6,544	
Imports.....	8,441	7,119	6,724	8,164	
Total supply.....	20,889	18,646	17,888	14,708	
Fresh exports.....	—	—	—	—	
Available for domestic use.....	20,889	18,646	17,888	14,708	
Processed.....	2,026	3,262	3,138	2,109	
Available for fresh use.....	18,863	15,384	14,750	12,599	
Net trade.....	- 8,441	- 7,119	- 6,724	- 8,164	
TOMATOES					
Production					
Open field.....	122,335	128,082	129,825	158,836	
Hot house.....	6,396	15,042	21,989		
Total.....	128,731	143,124	151,814		
Imports.....	159,303	168,324	189,119	184,797	
Total supply.....	288,034	311,448	340,933		
Fresh exports.....	—	1,640 ^a	1,592	2,526	
Available for domestic use.....	288,034	309,808	339,341		
Net trade.....	-159,303	-166,684	-187,527	-182,271	
RUTABAGAS (TURNIPS)					
Production.....	213,778 ^f	233,330	214,616	240,468	
Imports.....	—	—	—	—	
Total supply.....	213,778	233,330	214,616	240,468	
Fresh exports.....	106,165	87,990	77,889	94,163	
Available for domestic use.....	107,613	145,340	136,727	146,305	
Processed.....	580	1,251	2,000	2,000	
Available for fresh use.....	107,033	144,089	134,727	144,305	
Net trade.....	+106,165	+ 87,990	+ 77,889	+ 94,163	

^a 1958-59 to 1960-61 average.^b 1957-60 average.^c 1961-64 average.^d 1964-65 to 1965-66 average.^e 1962-65 average.^f 1959-60 to 1960-61 average.

TABLE 9—CANNED VEGETABLES AND PRODUCTS, SUPPLY, DISPOSITION AND ACREAGE, CANADA, 1956-60 TO 1968-69

	Average 1956-60	Average 1961-65	1966-67	1967-68	1968-69
thousand pounds					
ASPARAGUS					
Stocks at April 1.....	1,210	888	1,034	1,073	880
Production.....	4,651	6,687	7,538	7,559	
Imports.....	1,428	760	423	471	
Total supply.....	7,289	8,335	8,995	9,103	
Exports.....	—	—	—	—	
Stocks at March 31.....	1,128	920	1,073	880	
Domestic disappearance.....	6,161	7,415	7,922	8,223	
Canada.....	2,182	2,106	2,000	1,730	1,820
acres for processing					
GREEN BEANS					
Stocks at July 1.....	10,275 ^a	6,145	6,761	9,313	11,362
Production.....	—	29,728	36,662	43,516	
Imports.....	—	—	—	—	
Total supply.....	10,275 ^a	35,873	43,423	52,829	
Exports.....	—	—	3,388	3,094	
Stocks at June 30.....	8,643 ^b	6,748	9,313	11,362	
Domestic disappearance.....	1,632	29,125	30,722	38,373	

TABLE 9—CANNED VEGETABLES AND PRODUCTS, SUPPLY, DISPOSITION AND ACREAGE, CANADA,
1956-60 TO 1968-69 (Continued)

	Average 1956-60	Average 1961-65	1966-67	1967-68	1968-69
thousand pounds					
WAX BEANS					
Stocks at July 1.....	7,790 ^a	6,450	3,927	11,219	21,858
Production.....	53,733 ^a	45,953	72,681	69,772	
Imports.....	—	—	—	—	
Total supply.....	61,523	52,403	76,608	80,991	
Exports.....	—	22,223 ^a	21,452	15,735	
Stocks at June 30.....	7,190 ^b	6,157	11,219	21,858	
Domestic disappearance.....	54,333	46,246	43,937	43,398	
acreage for processing					
Canada.....	10,236	19,438	25,110	29,340	21,420
thousand pounds					
CORN					
Stocks at July 1.....	34,316	33,799	19,693	28,113	25,096
Production.....	79,175	94,038	102,394	100,562	
Imports.....	3,961	1,126	3,904	1,432	
Total supply.....	117,452	128,963	125,991	130,107	
Exports.....	954	5,571	11,109	12,075	
Stocks at June 30.....	33,858	31,303	28,113	25,096	
Domestic disappearance.....	82,640	92,089	86,769	92,936	
acreage for processing					
Canada.....	39,174	38,550	45,810	44,480	45,350
CARROTS					
Stocks at July 1.....	2,354	3,582	2,017	3,934	n.a.
Production.....	6,071	9,063	10,089	9,265	
Imports.....	—	—	—	1,894	
Total supply.....	8,425	12,645	12,106	15,093	
Exports.....	—	—	390	88	
Stocks at June 30.....	2,105	3,382	3,934	n.a.	
Domestic disappearance.....	6,320	9,263	7,782	15,005	
acreage for processing					
Canada.....	n.a.	n.a.	n.a.	n.a.	n.a.
thousand pounds					
MUSHROOMS					
Stocks at July 1.....	n.a.	n.a.	n.a.	n.a.	
Production.....	4,346	4,783	11,633	14,310	
Imports.....	554	836	2,057	3,104	
Total supply.....	n.a.	n.a.	n.a.	n.a.	
Exports.....	—	—	—	—	
Stocks at June 30.....	n.a.	n.a.	n.a.	n.a.	
thousand pounds					
GREEN PEAS					
Stocks at July 1.....	44,267	24,804	37,696	23,486	10,985
Production.....	102,550	112,231	108,052	96,183	
Imports.....	956	357	—	—	
Total supply.....	147,773	137,392	145,748	119,669	
Exports.....	1,501	1,811	1,071	1,267	
Stocks at June 30.....	39,680	28,543	23,486	10,985	
Domestic disappearance.....	106,592	107,038	121,191	107,417	
acreage for processing					
Canada.....	47,472	54,874	55,940	59,290	66,990
thousand pounds					
TOMATOES					
Stocks at July 1.....	19,238	17,706	12,542	22,103	30,894
Production.....	81,448	102,634	88,889	99,321	
Imports.....	18,169	17,304	28,443	22,782	
Total supply.....	118,855	137,644	129,874	144,206	
Exports.....	78	35	—	—	
Stocks at June 30.....	23,784	12,685	22,103	30,894	—
Domestic disappearance.....	94,993	124,924	107,771	113,312	

TABLE 9—CANNED VEGETABLES AND PRODUCTS, SUPPLY, DISPOSITION AND ACREAGE, CANADA, 1956-60 TO 1968-69 (Continued)

	Average 1956-60	Average 1961-65	1966-67	1967-68	1968-69
acres for processing					
TOMATOES					
Contracted acreage					
Ontario.....	30,212	20,912	23,460	23,790	20,970
Canada.....	36,994	23,272	24,890	25,640	23,104
thousand pounds					
TOMATO JUICE					
Stocks at July 1.....	46,702	49,441	73,595	33,709	65,408
Production.....	147,542	197,856	186,968	227,179	
Imports.....	21,757	9,691	7,706	3,566	
Total supply.....	216,001	256,988	268,269	264,454	
Exports.....	2,828	11,640	13,730	11,434	
Stocks at June 30.....	52,762	51,623	33,709	65,408	
Domestic disappearance.....	160,411	193,725	220,830	187,612	
thousand pounds					
TOMATO PASTE, PULP AND PUREE					
Stocks at July 1.....	6,575	5,074	2,881	2,629	n.a.
Production.....	5,113	5,505 ^b	—	3,805	
Imports.....	22,071	26,595	48,533	47,914	
Total supply.....	33,759	37,174	51,414	54,348	
Exports.....	21 ^b	—	—	—	
Stocks at June 30.....	6,335	4,820	2,629	n.a.	
Domestic disappearance.....	27,403	32,354	48,785	54,348	

^a 1958-60 average.

^b 1958-61 average.

^c Green and wax beans.

TABLE 10—PRODUCTION OF FROZEN FRUIT AND VEGETABLES, CANADA, 1956-60 TO 1967

	Average 1956-60	Average 1961-65	1966	1967
thousand pounds				
Apples.....	1,659 ^a	5,860	8,029	7,929
Blueberries.....	3,728	5,129	12,287	11,699
Cherries.....	3,986	9,058	5,946	11,059
Peaches.....	153 ^b	414 ^c	660	607
Plums.....	25 ^c	293 ^b	875	726
Raspberries.....	7,628	9,048	12,136	12,792
Rhubarb.....	175 ^a	823	720	754
Strawberries.....	10,726	13,403	18,237	16,825
Other fruit.....	1,673	844 ^c	1,652	763
Total.....	29,753	44,872	60,542	63,154
Asparagus.....	—	526	734	894
Broccoli.....	—	1,012 ^c	2,089	2,996
Brussel's sprouts.....	—	1,058 ^a	1,463	1,614
Beans, green.....	3,519	9,848	13,125	13,861
Beans, wax.....	581	1,397	1,965	2,261
Corn.....	6,516	11,501	18,275	20,520
Corn-on-cob.....	266	1,252	2,093	4,105
Peas.....	25,449	41,304	49,917	53,148
Other vegetables.....	4,178	5,226 ^c	17,392	15,856
Total.....	40,509	73,124	107,053	115,255

^a 4 years only.

^b 2 years only.

^c 1 year only.

^d 3 years only.

TABLE 11—FROZEN FRUIT AND VEGETABLES: SUPPLY AND DISPOSITION, CANADA, 1956-60 TO 1968-69

	Average 1956-60	Average 1961-65	1966-67	1967-68	1968-69
thousand pounds					
FROZEN FRUIT					
Stocks at June 1.....	14,483	17,996	22,329	21,565	18,018
Production ^a	26,025	39,743	48,255	51,455	
Imports ^a	12,864	17,812	17,681	14,693	
Total supply.....	53,372	75,551	88,265	87,713	
Exports ^a	223	470	568	2,640	
Stocks at May 31.....	14,796	19,755	21,565	18,018	
Domestic disappearance.....	38,353	55,326	66,132	67,055	
Net trade.....	-12,641	-17,342	-17,113	-12,053	
FROZEN VEGETABLES					
Stocks at June 1.....	18,073	33,077	35,754	34,232	38,967
Production.....	40,509	73,124	107,053	115,255	
Imports.....	19,180	9,764	9,049	18,485	
Total supply.....	77,762	115,965	151,856	167,972	
Exports.....	1,244	15,817	42,367	52,972	
Stocks at May 31.....	21,249	34,832	34,232	38,967	
Domestic disappearance.....	55,269	65,316	75,257	76,033	
Net trade.....	-17,936	+ 6,053	+33,318	+34,487	

^a Excluding frozen blueberries.^b Excluding citrus juices.

TABLE 12—FRESH FRUIT AND VEGETABLE PRICES, CANADA, 1956-60 TO 1968-69

	Average 1956-60	Average 1961-65	1966-67	1967-68	1968-69
annual average wholesale price dollars					
APPLES					
Ontario MacIntosh, (Toronto), Fancy, bushels.....	3.03	3.00	3.45	3.86	
British Columbia MacIntosh (Winnipeg), Fancy, cell pack..	4.74	4.37	4.61	5.58	
APRICOTS					
British Columbia No. 1, (all markets), "Vu-pak".....	2.26	2.27 ^a	2.30	2.50	
BLUEBERRIES					
Eastern, 11 quart.....	4.60	4.76	4.86	5.13	
British Columbia, 24 pint crate....	8.22	8.62	10.08	9.82	
CHERRIES					
Ontario Black sweet, (all markets), 6 quart.....	2.25	2.24	2.13	2.65	
Ontario Sour, (all markets), 6 quart.....	1.59	1.66	2.18	2.53	
British Columbia Bing and Lambert, (all markets) twenty pounds.....	7.74	7.61	8.49	6.91	
GRAPES					
Ontario Blue, No. 1 (all markets), 6 quart.....	0.93	1.04	0.98	1.11	
PEACHES					
Ontario No. 1 (all markets), 6 quart, heaped.....	1.16	1.18	1.13	1.40 ^a	
British Columbia No. 1, (all markets), box.....	2.46	2.52 ^a	2.97	3.09	
PEARS					
Ontario (all markets), 6 quart.....	0.96	1.01	0.94	1.12 ^a	
British Columbia Bartlett, (all markets), box.....	5.57	5.36 ^b	5.91	8.37	

TABLE 12—FRESH FRUIT AND VEGETABLE PRICES, CANADA, 1956-60 TO 1968-69 (Continued)

	Average 1956-60	Average 1961-65	1966-67	1967-68	1968-69
annual average wholesale price dollars					
PLUMS AND PRUNES					
Ontario plums and prunes, 6 quart.....	1.10	1.09	1.34	1.60	
British Columbia prunes, "Vu-pak".....	2.12	2.31	2.54	2.67	
RASPBERRIES					
East, (all markets), pints.....	0.27	0.30	0.36	0.32	
West, (all markets), 24 pint crates.....	6.42	7.14	7.63	7.86	
STRAWBERRIES					
East, (all markets), quarts.....	0.36	0.39	0.43	0.43	
West, (all markets), 24 pint crates.....	6.64	6.99	7.42	7.93	
cents per pound					
ASPARAGUS					
Montreal.....	0.23	0.25	0.28	0.30	
Vancouver.....	0.24	0.29 ^a	—	—	
dollars per 50 pounds					
BEETS					
Montreal.....	1.17	1.33	1.70	1.83	
Toronto.....	1.34	1.47	2.15	1.85	
Vancouver.....	2.85	3.25	3.32	3.67	
dollars per 50 pounds					
CABBAGE					
Montreal.....	1.33	1.32	1.93	1.53	
Toronto.....	1.35	1.51	2.61	1.96	
Vancouver.....	2.86	3.25	2.94	5.17	
dollars per 50 pounds					
CARROTS					
Montreal.....	1.42	1.46	1.37	2.88	
Toronto.....	1.54	1.54	1.56	2.96	
Vancouver.....	2.80	3.16	3.71	4.60	
dollars per dozen					
CAULIFLOWER					
Montreal.....	2.03	2.04	2.62	2.52	
Toronto.....	2.16	2.22	3.30	3.37	
Vancouver.....	2.47	2.61	2.98	2.99	
dollars per crate					
CELERY					
Montreal.....	3.08 ^a	3.87	5.02	4.32	
Toronto.....	2.38	2.39	3.68	3.10	
Vancouver.....	3.26	3.81	4.95	5.40	
dollars per crate (38 pounds)					
CORN					
Montreal.....	3.01 ^d	2.59	3.30	3.28	
Toronto.....	1.99	1.63	2.26	1.95	
Vancouver.....	2.66	2.80	3.27	2.78	
dollars per 11 quart or two dozen (16 pounds)					
CUCUMBERS					
Montreal.....	1.26	1.56	1.97	2.46	
Toronto.....	1.13	1.24	1.37	1.57	
Vancouver.....	—	—	2.59	2.68	
dollars per one and one half dozen crate					
LETTUCE					
Montreal.....	1.81	1.66	2.09	2.11	
Toronto.....	3.20	2.51	2.90	2.87	
dollars per 50 pounds					
ONIONS					
Montreal.....	2.02	2.09	3.13	3.16	
Toronto.....	2.00	2.11	3.45	3.18	
Vancouver.....	2.72	3.50	4.04	4.34	
dollars per hundred pounds					
POTATOES					
Montreal (NB potatoes).....	2.67	2.93	2.14	2.56	
Toronto (PEI potatoes).....	3.06	3.44	2.76	3.18	

TABLE 12—FRESH FRUIT AND VEGETABLE PRICES, CANADA, 1956-60 TO 1968-69 (Continued)

	Average 1956-60	Average 1961-65	1966-67	1967-68	1968-69
annual average wholesale price					
dollars per bushel (18 pounds)					
SPINACH					
Montreal.....	1.11	1.30	1.52	2.09	
Toronto.....	1.39	1.51	1.48	—	
dollars per 11 quart (17 pounds)					
TOMATOES					
Montreal.....	2.39	2.05	3.00	3.38	
Toronto.....	1.72	1.79	1.77	1.71	
dollars per 50 pounds					
RUTABAGAS (TURNIPS)					
Montreal (Quebec).....	1.26	1.62	2.50	1.82	
Toronto (Ontario).....	1.16	1.42	1.85	1.81	
Vancouver (B.C.).....	2.54	2.91	3.29	3.19	

^a 4 quart basket.

^b 1965, "Handi-Pack", C Grade.

^c 1961-64 average.

^d 1963-65 average.

TABLE 13—MINIMUM PRICES FOR PROCESSING FRUIT AND VEGETABLES, CANADA, 1956-60 TO 1968-69

	Average 1956-60	Average 1961-65	1966-67	1967-68	1968-69
minimum prices for processing dollars per ton					
CHERRIES					
Ontario					
Sweet white.....	232.20	262.40	300.50	300.50	320.50
Sweet black for canning.....	252.20	271.40	340.50	340.50	360.50
Sweet black for brining.....	—	—	240.50	250.50	270.50
Sour.....	186.20	173.50	260.50	300.50	360.50
GRAPES					
Ontario.....	87.80	101.40	102.50	104.00	105.00
PEACHES					
Ontario					
Jubilee 2" up.....	98.50	88.50	125.50	140.50	135.50
Others 2" up.....	108.00	103.00	120.50	140.50	135.50
PEARS					
Ontario					
Bartlett 2" up.....	109.70	113.80	115.50	140.50	150.50
Kieffer 2' 1/4" up.....	58.30	59.70	67.00	67.00	—
PLUMS					
Ontario					
Felenburg and German.....	70.60	85.80	105.50	135.50	145.50
cents per 20 ounce quart					
RASPBERRIES					
Ontario					
Purple.....	25.8	29.1	36.5	40.0	41.0
Red.....	—	33.7 ^a	39.0	—	—
cents per 20 ounce quart					
STRAWBERRIES					
Ontario.....	15.6	17.3	19.5	—	20.5
minimum prices for processing dollars per pound					
ASPARAGUS					
Ontario.....	0.27	0.27	—	0.32	
dollars per ton					
GREEN AND WAX BEANS					
Ontario.....	107.20	105.50	110.00	110.00	110.00
dollars per ton					
CORN (CANNED)					
Ontario.....	25.80	26.20	28.00	29.00	29.50

TABLE 13—MINIMUM PRICES FOR PROCESSING FRUIT AND VEGETABLES, CANADA, 1956-60 TO 1968-69
(Continued)

	Average 1956-60	Average 1961-65	1966-67	1967-68	1968-69
minimum prices for processing dollars per ton					
CARROTS					
Ontario.....	52.00	49.50 ^a	—	54.10	54.44
dollars per ton					
GREEN PEAS					
Ontario (tenderometer reading 0 to 80).....	—	175.00 ^a	175.00	180.26	183.40
dollars per ton					
TOMATOES					
Ontario No. 1.....	40.60	42.20	48.96	50.00	50.50

^a 1963-65 average.

TABLE 14—MAPLE SUGAR AND SYRUP: PRODUCTION IN CANADA BY PROVINCES, 1956-60 TO 1968
(CALENDAR YEARS)

	Average 1956-60	Average 1961-65	1966	1967	1968
thousand gallons, syrup equivalent					
Canada.....	2,674	2,456	3,226	2,504	2,699
Nova Scotia.....	6	4	7	6	6
New Brunswick.....	18	12	14	11	10
Quebec.....	2,375	2,201	2,892	2,262	2,454
Ontario.....	275	239	313	225	229

TABLE 15—MAPLE SUGAR AND SYRUP: SUPPLY, DISPOSITION AND PRICES, CANADA, 1956-60 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968
thousand gallons, syrup equivalent					
Production.....	2,674	2,456	3,226	2,504	2,699
Imports.....	9	1	—	—	—
Total supply.....	2,683	2,457	3,226	2,504	2,699
Exports.....	1,270	1,262	1,437	1,447	—
Available for domestic use.....	1,413	1,195	1,789	1,057	—
dollars					
Farm prices, maple syrup per gallon....	3.67	4.07	4.46	4.39	—
Farm prices, maple sugar per pound....	0.46	0.54	0.61	0.66	—

TABLE 16—HONEY: SUPPLY, DISPOSITION AND PRICES, CANADA, 1956-60 TO 1968-69
(CROP YEAR, JULY 1 TO JUNE 30)

	Average 1956-60	Average 1961-65	1966-67	1967-68	1968-69 Estimate
thousand pounds					
Stocks at July 1.....	7,535	8,528	11,411	13,163	16,901
Production.....	29,516	38,746	44,502	45,682	34,262
Imports.....	3,792	2,688	4,558	2,050	—
Total supply.....	40,843	49,962	60,471	60,895	—
Exports.....	1,222	5,184	7,339	5,815	—
Available for domestic use.....	39,621	44,778	53,132	55,080	—
Stocks at June 30.....	8,537	8,871	13,163	16,901	—
Domestic disappearance.....	31,084	35,907	39,969	38,079	—
dollars					
Average farm price per pound.....	0.17	0.17	0.18	0.17	—

SPECIAL CROPS

SUGAR BEETS

Situation

Canadian sugar beet acreage for harvest in 1968 is estimated at 81,200 acres, compared with 83,305 in 1967. In 1968, in Ontario, as a result of the closing of the sugar beet plant at Chatham, no sugar beets were contracted. The elimination of this crop in Ontario is partly offset by sharp increases in other provinces. A record acreage for harvest has been estimated in Manitoba while in Quebec and Alberta, acreage is estimated at the highest levels since the "run-away" sugar prices of 1963 and 1964.

Preliminary crop reports indicate that beet yields and sugar content may be good in 1968, although the absence of Ontario production, which has historically averaged the highest yields per acre, will probably reduce the Canadian average production.

Yields in Manitoba and Alberta in 1967 were somewhat below average for those provinces. If the yield in 1968 for provinces still producing sugar beets is as good as the 1958-1967 average, 1968 production of beets will slightly exceed one million tons and will be only a little below that of 1967 when beets were also grown in Ontario.

World raw sugar prices have continued at very low levels. In terms of equivalent Canadian funds, the London price of raw sugar has been averaging about 2.3 cents per pound in recent months. These prices reflect a world situation of heavy stocks and a rate of production which continues to exceed consumption. Canadian sugar beet returns under the terms of contracts with processors would have been low had it not been for the federal stabilization program.

An International Sugar Conference, which included Canadian representation, met at Geneva in April and May of 1968 to continue earlier attempts to negotiate an effective International Sugar Agreement. The Conference recessed at the first of June to reconvene in September, with arrangements for further discussions to take place during the interim.

On June 7, 1968, the Minister of Agriculture announced the Federal Government's price support program for the 1968 sugar beet crop. Support was set at \$15.98 per standard ton of beets which is equivalent to that for the 1967 crop.

Outlook

The world supply and consumption situation is likely to result in the need for an Agricultural Stabilization Board payment on the 1968 crop. Since pro-

duction is under contract and since support is related to the ten-year average contract, total returns will likely average somewhat above the support level because of the separate provincial guarantee of returns in Quebec and because of improved average returns from by-products during the past ten years in Manitoba and Alberta.

DRY PEAS

Situation

The 1968 acreage of dry peas in Canada, including seed peas, increased by nearly 6,000 acres to 53,300 acres due mainly to increases in Alberta and Manitoba. The combined acreage in British Columbia and Alberta, which is mostly for seed production, increased by 2,700 acres over 1967. The increase in Alberta more than offset a further decline in British Columbia. Acreage in Quebec and Ontario remains at 4,700 acres, the same as for 1967.

Manitoba continues to be the major supplier of dry peas. However, poor growing conditions and poor harvest weather in that province will result in a lower yield and lower quality of peas than in 1967.

The total crop for Canada is expected to be around 915,000 bushels compared with about 1,115,000 bushels in 1967. There was little carryover for the second year in a row. Trade sources report slightly smaller crops than last year in the U.S. and in Roumania. However, good planting and growing conditions in Australia could produce a better than average crop.

Present Canadian production of dry peas is almost entirely of the yellow varieties for soup, as they are the principal type that can be grown profitably. The research program on peas has recently been changed to include the development of new varieties of the green, blue and marrowfat types adapted to Canadian conditions. Success in this program would open the possibility of capturing a portion of the substantial export market for such peas.

Outlook

The market for good quality peas is expected to be stronger than it was a year ago, and the longer-term prospects are that total marketings and prices for Canadian peas will continue close to levels of recent years. Domestic per capita consumption is declining but total domestic use remains fairly constant and exports are expected to continue to increase.

DRIED BEANS

Situation

The 1968 bean acreage is up by 4,900 acres to 90,900 acres. Yields are expected to be slightly higher in 1968 with an estimated production of 960,300 cwt. as compared to 860,800 cwt. in 1967. Because of wet weather conditions, the overall quality will be lower than last year's crop. Domestic consumption has been increasing gradually during the past ten years. Although actual data are not available pending completion of a review of basic statistics, the consumption trend is thought to have continued.

Domestic consumption plus exports including the World Food Program have exhausted supplies. Dried beans were exported to 14 countries as compared to 12 in 1967, and 11 countries received dried beans under the World Food Program. The Bean Board has not quoted any prices to producers for the new crop but it is estimated that the 1968-69 prices will average \$8.50 per hundred pounds down from the \$9.00 per hundred pound average in 1967-68 but higher than the five-year average (61-65) of \$7.01 per hundred pounds.

It is estimated that the 1968-69 U.S. bean crop will be 6,000,000 cwt. as compared to 4,800,000 cwt. in 1967-68. The U.S. price at mid-September to the producer was \$7.00 per hundred pounds, the same as a year ago.

The Ontario Bean Producers' Marketing Board is now operating under the agency plan whereby the Board controls the sale of all the beans. To accomplish this they entered into an agreement under the Agricultural Products Co-operative Marketing Act whereby the Board, with the backing of the Canadian Government, can borrow money to make an initial payment of \$5.50 per hundred pounds to the bean producers when delivered. The Board, through its agents, then proceeds to sell the total crop and the profits realized are pooled and returned to the producer. This provides the opportunity for the orderly marketing of beans. The Board will thus be able to offer advance sales before the crop is harvested. This feature will greatly facilitate sales, particularly to Britain, our largest market.

The agreement applies to the 1968 crop and is to remain in effect until December 30, 1969.

Outlook

Market prospects continue good despite the loss of a 2 per cent tariff advantage in the U.K. market. Canadian supplies are not expected to be sufficient to meet the market demand.

Demand in 1968-69 is expected to continue upward calling for an increase in production.

TOBACCO

Situation

Canadian tobacco farmers harvested a total of 134,630 acres in 1968 compared to a record 140,444 acres in 1967 and 129,926 in 1966. This acreage includes all types of tobacco.

Special Types—The Ontario burley tobacco crop, 1,579 acres, was grown under contract for the first time and consisted of nearly 400 acres of sweet briar or heavy bodied type, and about 1,200 acres of choice cigarette types. The reduction in burley acreage was designed to bring supply more in line with demand. 1968 burley tobacco production estimates indicate a volume of 2,750,000 pounds compared with a final crop figure of 4,689,600 pounds in 1967 and 5,484,300 pounds in 1966. Cigar filler tobacco is produced in Quebec and the acreage increased to 2,365 acres in 1968 compared to 2,141 in 1967 and 2,519 in 1966. The crop estimate is 3,500,000 pounds compared to 3,140,000 in 1967 and 3,934,000 in 1966. There is a limited acreage of so called Quebec "pipe" tobacco (aromatic and large pipe) and Ontario air-cured and fire-cured "dark" tobaccos which are grown under contract.

Flue-cured Tobacco—Harvested flue-cured tobacco acreage dropped to 130,214 acres in 1968, down from the record levels of 1967 (135,366) but well above the 1966 crop (124,218). Total flue-cured acreage in Quebec and Maritime provinces increased once more and accounted for 6.3 per cent of total harvested acreage. These areas produced flue-cured tobacco on 8,195 acres in 1968, 7,249 acres in 1967 and 6,707 in 1966.

Ontario is the major flue-cured tobacco producing area. The planted acreage in 1968 was 122,019 according to the Ontario Flue-Cured Tobacco Growers' Marketing Board. Ontario growers harvested an average of 108,800 acres during the ten-year period, 1955-1964, but reduced their acreage to 86,900 acres in 1965. However, 117,511 acres were harvested in 1966 and a record 128,117 acres were grown in 1967.

The Tobacco Board in Ontario decreased its acreage allotment from 138,812 acres in 1967 to 126,505 in 1968, a reduction of 12,307 acres. The actual acreage planted did not fall to the same extent because producers made an effort to utilize the extensive new investment which had been made in kilns, etc., in 1967. The 1968 allotment was established in order to reach a production target from 205 to 210 million pounds green weight, based on a provision for domestic manufacturing of 132 to 137 million pounds and an export target of no less than 73 million pounds. Once more, the export calculation included an arrangement between the Tobacco Advisory Committee of Britain, representing all British manufacturers,

and the Ontario Flue-Cured Tobacco Growers' Marketing Board for the purchase of 67.5 million pounds green weight from the 1968 crop. The arrangement was subject to satisfactory quality and prices and a planned production in keeping with other foreign and domestic demand.

The continued use of a formula system to convert poundage targets to acreage allotments facilitated the negotiations between the growers and buyer representatives. The mathematical formula takes into account yield range and trend and usual under-plantings.

The preliminary forecast of the total Canadian production of flue-cured tobacco in 1968 is 214.0 million pounds (farm or green weight basis), compared with a final figure of 204.3 million pounds in 1967 and the 1966 record crop of 223.7 million. The 1968 crop in Ontario is estimated at 205 million pounds which suggests a yield of nearly 1,700 pounds per acre, about average for the last five years although the yield has varied from 1,529 to 1,822 pounds in the period. The crop in the Maritimes and in Quebec has been estimated at 2 million and 7 million pounds, respectively.

More than 120 bulk-curing units were in use in Ontario in 1968 after experimental use in 1967. Research officials indicate that the quality of the tobacco cured by this new method is very good and in most cases more uniform than tobacco cured in the conventional way. Canadian growers have continued to emphasize technical innovations and mechanization such as bulk-curing, thus reducing reliance on manual labor so that it is no longer such a limiting factor in production.

The actual use of flue-cured tobacco in cigarette manufacturing increased by only one per cent in 1967. Estimates prepared on the basis of quarterly withdrawals from stocks during the latter part of that year indicate a downward trend in use which will, if continued, reduce the current rate of annual use to 124 million pounds on a re-dried weight basis. This compares to actual use in 1967 of 126.3 million pounds or roughly 140 million pounds green weight.

Consumption of flue-cured tobacco has been influenced by a number of significant variables during the past 15 months. The increasing popularity of filter-tip cigarettes and other measures resulting in economy in the use of cigarette tobaccos have been important factors on the leaf-tobacco market. The volume of cigarette sales has been reduced in response to increased retail prices, brought about by higher tobacco taxes, higher trade costs and higher manufacturing prices. The net result is a moderate decrease in the use of flue-cured tobacco.

Based on preliminary estimates, the exports of flue-cured tobacco, including stems and scrap and ex-

pressed in farm- or green-weight terms over the past three years, were:

Oct. 1965—Sept. 1966	48.7 million pounds
Oct. 1966—Sept. 1967	57.8 million pounds
Oct. 1967—Sept. 1968	57.0 million pounds

On the basis of estimated current usings of less than 140 million pounds green weight, stocks of aged flue-cured tobacco will have risen to approximately 12½ months supply by the end of December 1968. This is the second annual increase in domestic stocks which had fallen to abnormally low levels in December 1966.

Total world demand for cigarette tobacco continues to increase but the rate of growth is modest. A number of countries in Africa and Asia have expanded their production and export trade in flue-cured tobacco, in response to sanctions against Rhodesian trade and high producer prices in North America. Published reports suggested that the Rhodesian growers continue to produce roughly 130 million pounds of flue-cured tobacco annually, and that the stock pile of high-quality, flue-cured tobacco exceeds 200 million pounds. In the United States, 22 per cent of the 1967 crop entered Commodity Credit Corporation Stocks under the action of the price support program. Flue-cured leaf tobacco stocks held under U.S.A. government loan rose to 773 million pounds (green weight) in mid-1968. All of this tobacco qualifies under the export subsidy program at 10 cents per pound, double the rate of direct subsidy on all other exports. Eventually, disposal of the stocks from these countries will have a direct bearing upon the outlook on the international market.

Outlook

The domestic requirement for flue-cured tobacco seems to have stabilized and provision for about 140 million pounds of tobacco (green weight) from each of the 1968 and 1969 crops for use in 1969-70 and 1970-71 seems appropriate. Export orders indicate a present demand for at least 73 million pounds from the 1968 crop, leaving a reasonable balance between apparent requirement in 1968-69 (213 million) and the preliminary crop estimate (214 million).

The outlook for production in 1969 in Ontario will depend upon the demand from abroad. The requirement for Britain will be the principal factor in any increase or reduction in acreage in 1969, keeping in mind that high variability in yield per acre has a direct bearing on the outlook. Although exports in the 1968-69 shipping season will likely attain record levels between 70 and 75 million pounds, stocks will remain at relatively modest levels and the scope for sales to new offshore markets will be limited.

Assuming average yields, maintenance of acreage levels close to the 1968 levels (130,214 acres) would provide sufficient tobacco to maintain the sales level in 1968-69. However, this acreage would not provide

for the possibility of additional requirements by Britain or supplies for development of other export markets, including re-entry into a number of markets which were previously supplied in part from Canada.

TABLE 1—SUGAR BEET ACREAGE AND PRODUCTION, CANADA, 1956-60 TO 1968-69

	Average 1956-60	Average 1961-65	1966-67	1967-68	1968-69 (Forecast)
	acres				
Canada.....	87,382	90,232	81,272	83,305	81,200
Quebec.....	5,487	9,704	8,418	8,776	10,400
Ontario.....	22,610	15,102	11,925	14,124	—
Manitoba.....	21,750	25,308	23,045	26,898	31,000
Alberta.....	37,535	40,118	37,884	33,507	39,800
	thousand tons				
Production (Canada).....	1,122	1,188	1,166	1,081	1,000

TABLE 2—SUPPORT LEVEL AND AVERAGE RETURNS FOR SUGAR BEETS, 1959-60 TO 1968-69

	Support Level	Returns from Processors	Federal Payment	Provincial Payment	Total Returns
		dollars per standard ton*			
1959-60.....	93 per cent	11.62	2.51	—	14.13
1960-61.....	14.23 per 270 pounds	11.77	1.40	—	13.17
1961-62.....	13.18 per 250 pounds	11.62	1.93	0.13	13.68
1962-63.....	13.72	18.64	—	—	18.64
1963-64.....	13.72	18.73	—	—	18.73
1964-65.....	13.72	11.62	3.15	—	14.77
1965-66.....	14.35	10.78	6.38	—	17.16
1966-67.....	14.35	11.00	4.83	—	15.83
1967-68.....	15.50	—	—	—	—
1968-69.....	15.98	—	—	—	—

* Equivalent to 250 pounds of refined sugar.

TABLE 3—DRY PEAS: ACREAGE, AVERAGE YIELD PER ACRE, DISPOSITION AND PRICES IN CANADA, 1956-60 TO 1968-69 (CROP YEAR AUGUST 1 TO JULY 31)

	Average 1956-60	Average 1961-65	1966-67	1967-68	1968-69 (Forecast)
	acres				
Acreage					
Canada.....	74,120	60,760	61,300	47,400	53,300
Quebec.....	3,020	1,580	1,400	1,700	1,700
Ontario.....	4,660	2,600	2,500	3,000	3,000
Manitoba.....	50,720	43,400	46,000	30,000	33,000
Saskatchewan.....	2,980	2,440	1,000	800	1,000
Alberta.....	7,000	8,100	8,000	10,000	13,000
British Columbia.....	5,740	2,640	2,400	1,900	1,600
	bushels				
Yield per acre (Canada).....	17.3	19.6	17.8	23.5	17.2
	thousand bushels				
Canada					
Production.....	1,284	1,191	1,094	1,115	915
Imports.....	53	71	82	50	—
Total supply.....	1,337	1,262	1,176	1,165	965
Exports.....	353	375	516	514	315
Available for domestic use.....	984	887	660	651	650
	dollars per bushel				
Average farm price.....	2.10	2.23	2.45	2.28	2.50

TABLE 4—DRIED BEANS: ACREAGE, AVERAGE YIELD PER ACRE, DISPOSITION AND PRICES IN CANADA, 1956-60 TO 1968-69 (CROP YEAR AUGUST 1 TO JULY 31)

	Average 1956-60	Average 1961-65	1966-67	1967-68	1968-69 (Forecast)
acres					
Acreage					
Canada.....	65,660	76,060	118,000*	86,000	90,900
Quebec.....	1,340	980	1,000	1,000	900
Ontario.....	64,320	75,080	117,000	85,000	90,000
hundred pounds					
Yield per acre (Canada).....	10.26	13.44	14.88	10.1	10.56
hundred pounds					
Canada					
Production.....	673,800	1,024,800	1,759,200	860,800	960,300
Imports.....	80,400	67,200	64,800	71,268	50,000
Total supply.....	754,200	1,092,000	1,824,000	932,068	1,010,300
Exports.....	70,800	310,800	622,900	667,378	
dollars per hundred pounds					
Average farm price.....	6.15	7.01	6.83	9.00	8.50

* Census bench mark under review.

TABLE 5—TOBACCO ACREAGE, PRODUCTION AND PRICES, 1956-60 TO 1967-68 (CROP YEAR OCTOBER 1 TO SEPTEMBER 30)

	Average 1956-60	Average 1961-65	1966-67	1967-68 (Estimated)
acres				
Acreage				
Ontario				
Flue-Cured.....	119,054	98,786	128,117	122,019
Burley.....	4,577	3,153	2,422	1,579
Darks.....	441	435	332	—
Quebec				
Flue-Cured.....	5,480	5,575	6,215	6,625
Cigar.....	3,981	2,713	2,141	2,365
Maritimes				
Flue-Cured.....	38	742	1,034	1,570
Canada				
Flue-Cured.....	124,595	105,103	135,366	130,214
Burley.....	4,636	3,189	2,422	1,579
Cigar.....	3,981	2,713	2,141	2,365
Darks.....	441	442	332	—
Total.....	133,653	111,447	140,261	—
thousand pounds, green weight				
Production				
Flue-Cured.....	177,275	180,081	204,300	214,000
Burley.....	7,490	6,503	4,690	2,750
Cigar.....	4,895	4,273	3,140	3,500
cents per pound, green weight				
Average Farm Price				
Flue-Cured.....	51.46	57.15	69.08	—
Burley.....	36.55	43.05	51.40	—
Cigar.....	26.32	25.82	32.50	—

CEREAL, OILSEED AND FORAGE CROP SEEDS

PEDIGREED CEREAL AND OILSEED CROP SEEDS

Situation

Wheat—Acreage of pedigreed spring wheat amounted to 145,000 acres in 1968, less than half of last year's figure of 325,000 acres. Production is forecast at about 4 million bushels compared with about 9 million bushels in 1967. The variety Manitou accounted for about 86 per cent of the total crop compared with about 93 per cent a year ago. Other main varieties were Selkirk, 4,400 acres for about 170,000 bushels; Thatcher, 7,200 acres for 200,000 bushels; and Park, 4,400 acres for about 125,000 bushels. The quality of the 1968 crop is expected to be quite seriously affected by poor harvesting weather and frost damage in many areas. The full extent of the frost damage cannot be determined until widespread germination tests have been made. The production and acreage of winter wheat decreased slightly from 1967. Inspected acreage in 1968 was 22,000 acres compared with 25,000 acres a year ago. Estimated production is placed at about 1 million bushels, half of which was the hard red variety, Winalta, grown in Alberta and the balance was the soft white varieties, Genesee and Talbot, produced in Ontario. Durum wheat acreage and production were higher than a year ago. Inspected acreage was 8,800 acres with an estimated production of 275,000 bushels, nearly all of which was the variety Stewart 63.

Oats—Both acreage and estimated production of pedigreed oats were well above 1967 levels. The principal increase occurred in Ontario but there were significant increases in Saskatchewan and Alberta. There were about 100,000 acres inspected for an estimated production of 6 million bushels compared with 67,000 acres and 4.2 million bushels in 1967. There has been considerable frost damage to the oat crops in many areas of Western Canada. In the Peace River District it is estimated that 50 per cent of the crops are affected. General quality will also be lower than average because of the unusually wet harvest season. The oat crop in Eastern Canada, particularly in Ontario, was above average in both quality and yield. Garry was still the main variety grown with 38,000 inspected acres in 1968 for an estimated production of about 2.2 million bushels, two-thirds of this was in Ontario. Of the remaining 21 varieties being grown, production of Kelsey amounted to about 750,000 bushels, Rodney 745,000 bushels, Harmon 720,000 bushels, Glen 365,000 bushels and Russell 275,000 bushels.

Barley—There was a significant increase in both inspected acreage and estimated production of pedigreed barley, with 67,000 acres and an estimated production of 3 million bushels in 1968, compared with 36,000 acres and 1.8 million bushels in 1967. There were substantial percentage increases in every province. The variety Conquest accounted for about 1 million bushels followed by Herta at about 800,000 bushels. Other major varieties were Paragon, Galt and Keystone. The crop produced in Western Canada has suffered from poor harvest weather and some frost damage. The Eastern crop however is of good quality and yielded above average, particularly in Ontario.

Oilseed Crops—Acreage of pedigreed flax was slightly smaller than in 1967 but estimated production was up somewhat. There were about 29,000 acres inspected with an estimated production of about 500,000 bushels. The production of the principal variety, Noralta, was estimated to be 300,000 bushels in 1968, compared with 359,000 bushels in 1967. The crop was affected by poor harvest weather and frost but damage may not be as serious as for the cereal crops. Inspected acreage of pedigreed rapeseed was about 4 times that of a year ago and estimated production of seed, 3 times the 1967 level. There were 16,000 acres inspected for an estimated crop of about 10 million pounds. This was by far the largest crop of rapeseed produced and is almost entirely due to greatly increased acreage in Saskatchewan. The principal varieties in production were Oro, Echo and Target. There were about 5,000 acres in pedigreed soybeans and production was well over that of 1967.

Hybrid Corn—Hybrid corn seed acreage in 1968 was slightly more than a year ago. However yields will not be as high as in 1967 because of cool wet weather particularly during the early growing season. Another factor reducing yields was a larger proportion of single cross hybrids.

White Beans—Acreage in white beans was about the same as in 1967. Yields, however will be lower and a smaller crop is forecast.

Outlook

Wheat—Although production of pedigreed seed of spring wheat in 1968 was much less than in 1967 it is felt that supplies will be sufficient to meet the expected domestic demand for seed of the main varieties in 1969. There are no indications of any significant increase in demand in the United States for Canadian seed but it is believed that there should be the usual market for several hundred thousand bushels. With the expanded production this year of pedigreed seed

of Durum varieties there should be adequate supplies of pedigreed seed to meet the demand.

Oats and Barley—In spite of a much larger crop of pedigreed seed of oats and barley produced in 1968, the extremely unfavorable harvest weather together with extensive frost damage could result in local shortages of good quality pedigreed seed of some varieties in 1969 in Western Canada. More northern areas particularly the Peace River District of Alberta and British Columbia are expected to be the most seriously affected in this regard. However, there should be sufficient pedigreed seed of acceptable quality in the Prairie Provinces to meet overall needs of that region. In Eastern Canada there is an abundance of good quality seed of the recommended varieties.

Oilseed Crops, Hybrid Corn and White Beans—Supplies of pedigreed seed of flax, soybeans, rapeseed, hybrid corn and white beans should be adequate for domestic needs in 1969.

FORAGE CROP SEEDS (all classes)

Situation

Legume Crops—In general, 1968 was not a good year for seed production of the legume crops particularly in Western Canada where most of them are produced. There was too much vegetative growth and cool wet weather during the normal pollination period resulted in a poor seed set. There was extremely poor harvesting weather for the crops in Western Canada and furthermore there was frost damage in most of the producing areas. In Eastern Canada, however, growing and pollination conditions were quite favorable for the two principal legume crops produced in that area, double-cut red clover and bird's-foot trefoil.

Alfalfa—The alfalfa seed crop in 1968 will be smaller than the 5.5 million pounds produced in 1967. Production is forecast at about 2.5 million pounds for the total crop and of this there is an estimated production of about 700,000 pounds of certified seed. There were more than 6,800 acres of certified varieties compared with about 7,600 acres in 1967. The principal varieties were Vernal at about 3,700 acres, Rambler, 1,900 acres and Beaver, 1,000 acres.

Alsike Clover—Alsike clover seed production, which is practically all produced in Alberta and British Columbia, is expected to be considerably smaller in 1968 than in 1967. The 1968 crop is forecast at about 5 million pounds.

Red Clover—Double-cut red clover seed production in Ontario and Quebec may be somewhat larger than in 1967 because of good yields, although the acreage saved for seed production has decreased. The crop is forecast at about 2.5 million pounds. Single-cut red clover seed production in Alberta has declined because of decreased markets. This, combined with poor harvesting conditions, has resulted in a crop estimated at about 4 million pounds.

Sweet Clover—It is expected that the sweet clover seed crop will be much smaller than last year's and has been forecast at only 4 million pounds.

Bird's-foot trefoil—Bird's-foot trefoil seed production in Ontario, the principal producing area, will be smaller in 1968 than in 1967 owing to winter killing and lower yields. The crop is forecast at about 500,000 pounds. About two-thirds of the crop is pedigreed seed of the varieties, Empire and Viking.

Timothy—The production of Timothy seed is forecast at about 9.5 million pounds compared with 13.4 million pounds in 1967. This is the smallest crop since 1951. However the carry-over was the largest on record amounting to about 5.5 million pounds. Production of the Climax variety was considerably less than a year ago. Inspected acreage of this variety amounted to about 20,000 acres compared with 34,000 acres in 1967. Production of foreign varieties for export under the Organization For Economic Co-operation and Development Herbage Seed Scheme amounted to about 1.5 million pounds, unchanged from 1967.

Bromegrass—Estimated production of bromegrass seed has been placed at about 4.5 million pounds, about the same as in 1967. Growing conditions were generally good in all producing areas although yields were less than average because of poor harvest weather. Much of the crop, particularly in Manitoba and Saskatchewan, lay in the swath a considerable time and therefore was of lower quality. There were 3,000 acres of certified Carlton, 1,900 acres of Saratoga and 1,000 acres of Red Patch.

Crested Wheatgrass—The crested wheatgrass seed crop is estimated at 925,000 pounds, only slightly larger than in 1967. Production was down somewhat in Saskatchewan but up slightly in Alberta. The prolonged wet weather interfered with harvesting, and reduced yields.

Meadow Fescue—Meadow fescue seed production is forecast at only about 2 million pounds compared with last year's large crop of 5.8 million pounds. This is the smallest crop since 1964. The reduction was mainly due to plow down of about 50 per cent of the acreage in Manitoba. New stands produced good

yields but older fields were patchy. Acreage of certified Ensign amounted to about 1,000 acres compared with about 2,800 acres in 1967. Acreage of the new variety, Trader, increased to about 300 acres compared with less than 100 acres in 1967.

Creeping Red Fescue—Creeping red fescue seed production has been forecast at about 18 million pounds, the largest crop since 1961 and about 60 per cent larger than in 1967. Only about 500,000 pounds of this is pedigreed seed. Good growing conditions were experienced. It had been feared that cool weather during the pollination period might have affected yields but this was not the case. Wet weather interfered somewhat at harvest but caused no serious damage.

Russian Wild Ryegrass—Production of Russian wild ryegrass seed in Saskatchewan and Alberta will be at about last year's level of 135,000 pounds. Production has been declining in recent years from the peak production in 1964 of 1,100,000 pounds. There were about 600 acres of pedigreed Sawki compared to about 500 acres a year ago.

Outlook

Retail prices of most kinds of seeds used for forage crop production are expected to be somewhat higher in 1969 than they were for the 1968 planting season. Smaller crops of most varieties and a slightly improved export market are responsible for this increase. Prices to growers for most kinds of forage crop seeds were up slightly from the low prices that prevailed a year ago. This, together with the increasing interest in Western Canada for cash crops to replace cereals and some other main crops, may encourage an increased acreage in forage crop seed production in the next few years. Also the increasing demand in Europe for certified seed of adapted varieties is expected to result in some expansion of acreage in varieties being grown in Western Canada under the O.E.C.D. Herbage Seed Scheme.

Further restrictions on the import of commercial seed have been implemented by some European countries. The most recent step in this regard is the import prohibition by West Germany, effective July 1st, 1968, on all seed that is not certified and not on the German variety registration list. This will affect all exports of Canadian commercial seed such as Alsike and Single-cut red clover seed to that market. Exports to West Germany in the past few years have averaged about 2 million pounds annually.

In the effort to find new markets for Canadian forage seed, a Seed Trade Mission sponsored by the Federal Government visited a number of South American countries in February 1968. Argentina

seems to offer the most promise for immediate export sales of single-cut red clover, brome grass and perhaps some of the western wheatgrasses. Arrangements were made for official tests of Canadian varieties in the other countries visited.

The testing of Canadian varieties in foreign countries continues, with the object of assessing their adaptability, in order to expand market outlets. While many varieties are currently under test in some 25 countries this program has not been in operation long enough to provide full information on their performance.

Alfalfa—With a small Canadian crop in prospect there will not be sufficient production to meet domestic needs and from three to four million pounds of alfalfa seed will need to be imported. Principal demand in Canada continues to be for certified seed of Vernal and some Flemish type varieties. It is expected that this demand can be met by imports from the United States where good quality certified seed of these varieties is available.

Alsike Clover, Single-cut Red Clover and Sweet Clover—These seed crops are produced mainly for export and because of the much smaller crops than normal, no difficulty will be encountered in marketing the crops. The United States is expected to be the principal market.

Double-cut Red Clover—In spite of expected higher production, supplies for 1969 planting probably will be limited and higher-priced than a year ago. Both Britain and the United States have smaller crops than normal and are in the market for additional supplies.

Timothy—The forecast production together with the carryover should provide sufficient Timothy seed to meet domestic needs with a small surplus. Retail prices for the 1969 season will be higher than in 1968. While there is not expected to be much demand in Europe, particularly for common Timothy seed, there should be a good market in the United States for both common and Climax varieties.

Brome grass—There should be sufficient supplies of brome grass seed to meet domestic needs and to provide a small surplus for export. The United States had a fair crop of brome and the market there for Canadian seed is not expected to be stronger than normal. Retail prices will likely be high compared with the 1961-65 average price but at about the same level as in 1967.

Meadow fescue—In spite of a much smaller crop than in 1967, total supplies, resulting from the large carryover in the hands of both the trade and growers, will be about as large as a year ago. There is little or no export demand and it appears there will be diffi-

culty in marketing the crop. There may be some market in the United States for meadow fescue as a substitute for ryegrass in lawn grass mixtures.

Creeping red fescue—While there is a moderate demand for export at low prices it is not expected that the market will strengthen, because there is surplus

world production of fine-textured grasses.Kentucky bluegrass prices are quite high and this is encouraging the use of creeping red fescue as a substitute; these kinds are generally considered to be interchangeable in lawn grass mixtures. In spite of the export prospects, there will likely be a heavy inventory carried over because of the large total supplies available.

TABLE 1—ACREAGE AND ESTIMATED PRODUCTION OF PEDIGREED WHEAT, OATS, BARLEY AND BEANS, CANADA, 1967 AND 1968

	Wheat		Oats		Barley		White Beans	
	Acres	Busheis	Acres	Bushels	Acres	Bushels	Acres	Bushels
	thousands							
Maritimes.....	1	24	2	90	—	—	—	—
Quebec.....	1	23	13	890	▲	10	—	—
Ontario.....	11	558	37	2,870	10	665	4	85
Manitoba.....	66	2,000	18	600	17	765	—	—
Saskatchewan.....	73	1,500	11	700	19	800	—	—
Alberta.....	18	900	19	900	20	825	—	—
British Columbia.....	1	20	—	—	▲	8	—	—
Canada, 1968.....	171	5,025	100	6,050	67	3,073	4	85
Canada, 1967.....	323	9,523	67	4,217	36	1,807	3	89

▲ less than 1,000 acres

TABLE 2—ACREAGE AND ESTIMATED PRODUCTION OF PEDIGREED FLAX, RAPESEED AND SOYBEANS, CANADA, 1967 AND 1968

	Flax		Rapeseed		Soybeans	
	Acres	Bushels	Acres	Pounds	Acres	Bushels
Quebec.....	160	3,000	—	—	—	—
Ontario.....	—	—	—	—	5,000	150,000
Manitoba.....	12,500	175,000	700	700,000	40	700
Saskatchewan.....	13,400	265,000	13,300	7,365,000	—	—
Alberta.....	3,400	66,000	2,200	2,000,000	—	—
Canada, 1968.....	29,460	509,000	16,200	10,065,000	5,040	150,700
Canada, 1967.....	30,919	465,722	3,932	3,480,000	4,044	120,790

TABLE 3—ALFALFA SEED PRODUCTION IN CANADA BY PROVINCES, 1956 TO 1968

	Average 1956-60	Average 1961-65	1966	1967 ,	1968
	thousand pounds				
Canada.....	3,511	4,439	2,139	5,602	2,500
Ontario.....	558	852	843	207	
Manitoba.....	1,008	1,054	750	1,750	
Saskatchewan.....	640	480	125	1,000	
Alberta.....	1,206	1,969	371	2,452	
British Columbia.....	99	84	50	200	

TABLE 4—ALFALFA SEED: SUPPLIES AND DISTRIBUTION, CANADA 1956-57 TO 1968-69
(CROP YEAR ENDING JUNE 30th)

	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67	1967-68	1968-69
thousand pounds					
Stocks, beginning of year.....	1,223	1,680	1,464	1,484	3,080
Production.....	3,511	4,439	2,139	5,602	
Imports.....	3,653	3,464	4,533	3,052	
Total Supply.....	8,387	9,583	8,136	10,138	
Exports.....	1,371	1,229	536	475	
Available for domestic use.....	7,016	8,354	7,600	9,663	

TABLE 5—ALSIKE CLOVER SEED PRODUCTION IN CANADA BY PROVINCE, 1956 TO 1968

	Average 1956-60	Average 1961-65	1966	1967 ,	1968
thousand pounds					
Canada.....	10,057	11,149	10,287	8,492	5,000
Ontario.....	32	12	2	42	
Manitoba.....	73	32	20	50	
Saskatchewan.....	163	57	250	200	
Alberta.....	8,029	9,033	7,565	6,100	
British Columbia.....	1,760	2,015	2,450	2,100	

TABLE 6—ALSIKE CLOVER SEED: SUPPLY AND DISPOSITION, CANADA, 1956-57 TO 1968-69
(CROP YEAR ENDING JUNE 30th)

	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67	1967-68	1968-69
thousand pounds					
Stocks beginning of year.....	2,313	2,900	3,654	3,895	2,980
Production.....	10,057	11,149	10,287	8,492	
Imports.....	3	5	—	20	
Total Supply.....	12,373	14,054	13,941	12,407	
Exports.....	7,022	7,705	8,934	8,663	
Available for domestic use.....	5,351	6,349	5,007	3,744	

TABLE 7—RED CLOVER SEED PRODUCTION IN CANADA BY PROVINCES 1956 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968
thousand pounds					
Canada.....	11,777	10,721	13,062	10,543	6,500
Maritimes.....	38	23	30	15	
Quebec.....	444	420	315	375	
Ontario.....	4,312	3,860	2,385	1,648	
Manitoba.....	518	540	1,500	500	
Saskatchewan.....	1,774	537	1,512	760	
Alberta.....	3,935	4,815	6,500	6,043	
British Columbia.....	756	526	820	1,202	

TABLE 8—RED CLOVER SEED: SUPPLY AND DISPOSITION, CANADA, 1956-57 TO 1968-69
(CROP YEAR ENDING JUNE 30th)

	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67	1967-68	1968-69
thousand pounds					
Stocks, beginning of year.....	3,856	2,500	3,904	6,423	5,211
Production.....	11,777	10,721	13,062	10,543	
Imports.....	1,818	485	529	1,902	
Total Supply.....	17,451	13,706	17,495	18,868	
Exports.....	8,037	6,634	6,233	12,050	
Available for domestic use.....	9,414	7,072	11,262	6,818	

TABLE 9—SWEET CLOVER SEED PRODUCTION IN CANADA BY PROVINCES, 1956-68

	Average 1956-60	Average 1961-65	1966	1967	1968
thousand pounds					
Canada.....	13,357	13,417	10,053	8,065	4,000
Ontario.....	581	398	103	83	
Manitoba.....	5,219	5,234	3,500	2,750	
Saskatchewan.....	3,500	1,940	1,500	1,000	
Alberta.....	3,716	4,994	4,100	3,832	
British Columbia.....	341	851	850	400	

TABLE 10—SWEET CLOVER SEED: SUPPLY AND DISPOSITION, CANADA, 1956-57 TO 1968-69
(CROP YEAR ENDING JUNE 30th)

	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67	1967-68	1968-69
thousand pounds					
Stocks, beginning of year.....	4,859	3,845	10,017*	8,355*	3,350
Production.....	13,357	13,417	10,053	8,065	
Imports.....	7	—	—	1	
Total Supply.....	18,223	17,262	20,070	16,421	
Exports.....	13,163	10,328	10,833	12,250	
Available for domestic use.....	5,060	6,934	9,237	4,171	

* Includes estimated carry-over in growers' hands.

TABLE 11—TIMOTHY SEED PRODUCTION IN CANADA BY PROVINCES, 1956 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968 Preliminary
thousand pounds					
Canada.....	16,603	13,865	23,361	13,405	9,500
Maritimes.....	675	205	400	200	
Quebec.....	2,547	1,967	2,500	2,300	
Ontario.....	11,571	7,209	6,811	4,000	
Manitoba.....	572	1,796	6,250	4,000	
Saskatchewan.....	417	1,564	4,000	1,250	
Alberta.....	689	946	3,000	1,480	
British Columbia.....	132	178	400	175	

TABLE 12—TIMOTHY SEED: SUPPLY AND DISPOSITION, CANADA, 1956-57 TO 1968-69
(CROP YEAR ENDING JUNE 30th)

	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67	1967-68	1968-69
	thousand pounds				
Stocks, beginning of year.....	2,077	2,017	4,621	5,077	5,571
Production.....	16,603	13,865	23,361	13,405	
Imports.....	1,749	2,765	649	1,911	
Total Supply.....	20,429	18,647	28,631	20,393	
Exports.....	5,735	6,762	10,314	5,478	
Available for domestic use.....	14,694	11,885	18,317	14,915	

TABLE 13—BROMEGRASS SEED PRODUCTION IN CANADA BY PROVINCES 1956 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968
	thousand pounds				
Canada.....	7,175	6,847	4,620	4,220	4,500
Manitoba.....	238	144	200	150	
Saskatchewan.....	2,100	2,270	1,300	1,000	
Alberta.....	4,691	4,301	3,000	3,000	
British Columbia.....	146	132	120	70	

TABLE 14—BROMEGRASS SEED: SUPPLY AND DISPOSITION, CANADA, 1956-57 TO 1968-69
(CROP YEAR ENDING JUNE 30th)

	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67	1967-68	1968-69
	thousand pounds				
Stocks, beginning of year.....	1,339	1,859	1,844	1,656	2,090
Production.....	7,175	6,847	4,620	4,220	
Imports.....	726	413	462	288	
Total Supply.....	9,240	9,119	6,926	6,164	
Exports.....	3,494	2,976	1,778	1,417	
Available for domestic use.....	5,746	6,143	5,148	4,747	

TABLE 15—CRESTED WHEATGRASS SEED PRODUCTION IN CANADA BY PROVINCES, 1956 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968
	thousand pounds				
Canada.....	1,487	2,021	1,020	908	925
Manitoba.....	39	79	30	40	
Saskatchewan.....	1,010	1,410	350	350	
Alberta.....	419	493	600	513	
British Columbia.....	19	39	40	5	

TABLE 16—CRESTED WHEATGRASS: SUPPLY AND DISPOSITION, CANADA, 1956-57 TO 1968-69
(CROP YEAR ENDING JUNE 30th)

	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67	1967-68	1968-69
	thousand pounds				
Stocks, beginning of year.....	412	909	499	358	788
Production.....	1,487	2,021	1,020	908	
Imports.....	160	20	45	52	
Total Supply.....	2,059	2,950	1,564	1,318	
Exports.....	685	94	631	82	
Available for domestic use.....	1,374	2,039	933	1,236	

TABLE 17—CREEPING RED FESCUE SEED PRODUCTION IN CANADA BY PROVINCES 1956 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968 Preliminary
thousand pounds					
Canada.....	11,857	14,004	15,300	11,263	18,000
Alberta.....	9,645	11,484	12,500	8,363	
British Columbia.....	2,212	2,520	2,800	2,900	

TABLE 18—CREEPING RED FESCUE: SUPPLY AND DISPOSITION, CANADA, 1956-57 TO 1968-69
(CROP YEAR ENDING JUNE 30th)

	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67	1967-68	1968-69
thousand pounds					
Stocks, beginning of year.....	3,791	4,179	3,052	4,371	1,806
Production.....	11,857	14,004	15,300	11,263	
Imports.....	55	30	9	384	
Total Supply.....	15,703	18,213	18,361	16,018	
Exports.....	10,658	13,278	11,005	10,818	
Available for domestic use.....	5,045	4,935	7,356	5,200	

TABLE 19—OTHER GRASS SEED PRODUCTION IN CANADA BY KINDS, 1956 TO 1968

	Average 1956-60	Average 1961-65	1966	1967	1968 Preliminary
thousand pounds					
Canada Bluegrass.....	81	21	—	—	—
Kentucky Bluegrass.....	493	302	327	60	—
Meadow Fescue.....	2,153	3,284	5,740	5,812	2,000
Orchard Grass.....	8	27	36	—	—

TABLE 20—MEADOW FESCUE SEED: SUPPLY AND DISPOSITION, CANADA, 1956-57 TO 1968-69
(CROP YEAR ENDING JUNE 30th)

	Average 1956-57 to 1960-61	Average 1961-62 to 1965-66	1966-67	1967-68	1968-69
thousand pounds					
Stocks, beginning of year.....	537	800	183	475	2,718
Production.....	2,153	3,284	5,740	5,812	
Imports.....	52	19	3	3	
Total Supply.....	2,742	4,103	5,926	6,290	
Exports.....	1,624	3,835	4,113	2,858	
Available for domestic use.....	1,118	268	1,813	3,432	

SUMMARIES OF PAPERS

GENERAL ECONOMIC SITUATION AND OUTLOOK

International Economic Situation

The renewed momentum of world economic activity, which developed in 1967 and continued into 1968, has shown signs of slackening. Steps taken in some countries to help with balance of payments difficulties have been dampening factors. These steps included a 10 per cent income tax surcharge and expenditure cuts in the United States which were designed to moderate the rapid growth. British industrial output has responded to the 1967 devaluation and merchandise exports have risen. However, the persistent strong import trend has continued the adverse balance of payments and official policy may thus favor the use of resources for export markets over use for domestic demand.

Growth trends have strengthened in the European Economic Community, with an upturn in economic activity in Germany and Italy. Economic gains in France were interrupted by strikes but are expected to resume. Other smaller European countries have shown mixed trends in 1968 but are expected on balance to achieve moderate growth rates in the coming year.

Japanese measures introduced in 1967 to moderate the economic growth and protect the balance of payments position have been effective and renewed expansion is expected when fiscal and monetary restraints are relaxed.

Economic trends in the more advanced primary exporting countries have improved as a result of increased agricultural production and increased volume of export sales at generally sustained prices. There have been moderate increases in the foreign exchange reserves of developing countries during 1968.

Canadian Economic Situation and Outlook

Canadian economic growth in 1968 is expected to be greater than in 1967 although slower than in other recent years. Rising prices and costs continued to give concern and led to an income tax surcharge as well as a slowdown in the rate of expansion of government programs. International confidence in the Canadian dollar strengthened in response to temporary measures taken in the wake of external pressures upon it.

Buoyant trends in the United States boosted Canadian economic activity and export sales expanded sharply. Increases were prominent for motor vehicles, non-ferrous metals, iron ore, petroleum, asbestos, lumber, wood pulp and fertilizers. Improved

world cereal supplies cut into exports of wheat and flour in the first half of 1968.

Advancing incomes showed in higher consumer spending as well as in government outlays. New housing construction increased after slowing in 1967. Business investment held steady. Reserve capacity in both plants and manpower was still available in 1968. Labor force growth was faster than job opportunities, especially during the summer student employment season with unemployment slightly over five per cent.

Personal disposable income is expected to show continued growth in 1969 with a consequently sustained economic growth rate. Easier monetary conditions will likely lead to further increases in housing. Some increases in non-farm inventory accumulation and business capital investment is expected. Merchandise exports, especially to the United States, are expected to increase more moderately because of the growth restraints in that country. Pressures on costs and prices are likely to be somewhat easier.

WORLD AGRICULTURAL REVIEW AND OUTLOOK

World agricultural production increased by three per cent in 1967; in the developing countries, the increase of six per cent in food production was the largest gain for many years. The large increase in Indian agricultural production, as well as in some other countries such as Pakistan, brought per capita production in the developing countries in 1967 above the 1965 and 1966 levels. Thus, the over-all food situation in developing countries may be considered much better in 1968 than in the previous two years.

World agricultural production in 1968 is expected to increase over the 1967 output. World wheat production is estimated to reach the high levels of the past two years. The 1968 production prospects for the five largest exporters—Australia, Argentina, Canada, France and the United States—point to an output above the record 3.25 billion bushels produced in 1966. A crop of about equal to 1967 is expected in Western Europe but in Eastern Europe wheat production will be well below the bumper crop of 1967. The Soviet Union is expected to harvest a slightly larger crop in 1968 than in 1967, but the total output of wheat in the Soviet Bloc countries will probably be smaller this year than a year ago. Production of coarse grains will probably be lower in 1968, but production of fats and oils will continue to rise this year. World supplies of milk and dairy products are expected to be larger in 1968 than in 1967. World meat supply is expected to continue its increasing trend in response to continued growth in demand.

The volume of world trade in agricultural products declined by one per cent in 1967. North America's export earnings declined sharply (12 per cent) because grain exports were much lower. As a direct result, world wheat stocks in major exporting countries as a whole increased by about 6 million tons to about 38 million tons by the end of the 1967-68 crop year. Although Canadian stocks are disproportionately large, the total 1968-69 carryover in exporting countries is generally considered ample but not excessive. However, butter stocks in Western Europe, North America and Oceania increased by 30 per cent (to approximately 450,000 tons) and created "surpluses of substantial proportions". Stocks of coffee, sugar, rubber, and tobacco continued to be large. All this indicates that the so-called surplus problem of certain commodities has not been solved, and it continues to exist in the world.

In 1967, the index of world export prices for primary agricultural products was about four per cent lower than in 1966. Prices for food (in dollar terms) increased by about 1 per cent but there was a 10 per cent decline in non-food prices. In the first half of 1968, the over-all world price level for agricultural products remained stable but stayed slightly below the level of the corresponding period of 1967.

Over the past year or so, a number of developed countries have been confronted with some problems of over-supply, and of deterioration of certain market prices. The critical state of some world markets for agricultural products such as, for example, dairy products, is raising difficulties. In Western Europe, for instance, the further accumulation of butter stocks, both within the EEC and elsewhere, has led several governments to introduce measures to discourage milk production or to encourage meat production.

There has been growing realization that price supports at the level required to safeguard commercial farms are not adequate instruments for relieving rural poverty. Social subsidies tied to reforms of farm structure thus begin to command more attention. Structural improvements and related measures have been given increasing emphasis; assistance takes a wide variety of forms, of which the most commonly used are grants and loans of various kinds to facilitate amalgamations or joint operation of small farms, and pensions or other payments to farmers who retire early. At the same time, it is recognized that for many years to come, farms too small for achieving reasonable profitability and adequate rewards for labor and capital will prevail.

While the over-all goal in the developing countries is to increase and diversify agricultural output, largely through the production of staple foods, serious ef-

forts are underway to improve the quality and reduce production costs of export crops. Increased emphasis is being put on the use of improved seeds, fertilizers, pesticides and other inputs. Credit schemes are also being increasingly used in these countries as a means of stimulating production in certain sectors, and are particularly important in connection with the adoption of new varieties of hybrid corn and short-stemmed wheat and rice. Some successes have already been scored in terms of national output—in Mexico, Pakistan and Turkey—and promising local results have been obtained in places in India and the Philippines.

CANADIAN FARM PRODUCTION

Farm production in Canada in 1968 is expected to be about five per cent above the 1967 level. Farm cash receipts from the sale of farm products may reach \$4.3 billion, slightly below the \$4.4 billion realized in 1967. Farm operating expenses and depreciation charges continue to move upwards as prices of most goods and services used in farming increase. With the decline in total cash receipts in 1968 and the increase in farm operating expenses, realized farm net income from farming operations is estimated to be below the 1967 level. In contrast, total net income from farming operations, which includes inventory changes is expected to reach \$1.7 billion, almost \$200 million greater than in 1967.

Total cash receipts from farming operations are expected to be slightly higher in 1969 than in 1968. While cash returns from crop sales will probably remain at 1968 levels, returns from marketings of livestock and livestock products should be higher. The increase in farm expenses is expected to more than offset the slight rise in cash receipts thus providing a realized net income below that of 1968.

AGRICULTURAL INPUT SITUATION AND OUTLOOK

Input Situation

Between 1966 and 1967, the volume of farm inputs increased by 2.9 per cent, compared to the 1963-67 annual average increase of 1.7 per cent. There was a proportionate increase for all major input categories in 1967 and consequently no change in the input mix. Real estate accounted for 23 per cent of all inputs, labor for 24 per cent, and capital inputs for 53 per cent.

Employment in agriculture was 2.8 per cent larger in 1967 compared with the previous year. This is in sharp contrast to the steady decline in the farm labor force in the past decade and was brought about main-

ly through an increase in numbers of unpaid family workers.

Purchases of farm machinery and equipment in 1967 were slightly below the 1966 record level but machinery operating expenditures were 3.4 per cent higher. Total expenditures for machinery and equipment amounted to an average of \$3,068 per farm, 2.7 per cent above the 1966 average.

Shipments by feed manufacturers of premixes and supplements in 1967 were 5 per cent greater than in 1966. Shipments of complete feed increased by almost 12 per cent. Expenditures for purchased feed increased by 11 per cent in 1967.

Fertilizer use is continuing to increase rapidly. Between 1966 and 1967, nutrient tonnage sold increased by 27 per cent for nitrogen, 12 per cent for phosphoric acid and 14 per cent for potash. Expenditures for fertilizer and lime went up by 17 per cent with the largest expansion in fertilizer sales occurring in the Prairie Provinces. The Canadian average for fertilizer and lime expenditures in 1967 was \$2.80 per acre for land under crops. The average was highest in the Maritimes with \$12.40 per acre and lowest in the Prairies with \$1.60. The average annual amount spent per farm in Canada was \$465 in 1967, twenty per cent more than in the previous year.

Sales of pest control products increased by over 13 per cent in 1967.

In 1967, the value of farm real estate, machinery and equipment, and livestock was estimated at \$21,186 million. Real estate accounted for 70.5 per cent of the total, machinery for 17.5 per cent, and livestock 12 per cent. The increase in total value was slightly less than in 1966.

Land prices continued an upward trend during 1967, increasing at an average rate of 10 per cent which is similar to that of 1966. The rate of increase in land prices appears to be leveling off in the Prairie Provinces, increasing in Ontario and dropping in other provinces.

An estimated \$2,179 million of credit was extended to farmers in 1967, \$233 million above 1966 estimates. Farm debts presently represent over 18 per cent of the value of farm real estate, machinery and equipment, and livestock. Crop insurance was taken out by over 65,000 farmers in the crop year 1968-69 for a coverage of \$187 million.

The composite price index of goods and services used by farmers increased by 6.4 per cent between 1966 and 1967.

Input Outlook

Expansion in farm inputs in 1968 is expected to be slightly less than in 1967 and will probably continue

at the same pace in 1969. Little change is envisaged for real estate inputs in 1969, while a resumption in the general down trend in farm labor inputs is likely. Capital input categories are generally expected to advance at the same rate as in 1968 but by less than that of 1967.

The number of hired workers and farm operators is expected to be less in 1968 than in 1967 but this decline will be partially offset by an increase in unpaid family labor employed on farms. If the general level of unemployment decreases in 1969, a further decrease in total farm employment is expected to occur.

It is expected that machinery and equipment sales will be less in 1968 than in 1967 but machinery operating expenses will likely increase. Total capital and operating costs for machinery and equipment in 1968 are expected to be down from 1967 levels, with gross capital investment declining considerably and machinery operating expenditures rising moderately. After a two-year slowdown in machinery purchases, an expansion is probable in 1969.

Shipments of complete feeds by manufacturers for 1968 may be down somewhat compared to 1967 while shipments of premixes and supplements are expected to remain unchanged. Expenditures for purchased feeds are not likely to increase in 1968, but will probably be higher again in 1969.

Fertilizer use and costs per farm are expected to be considerably higher in 1968 than in the previous year. The largest expansion in sales is expected to be in the Prairie Provinces. An increase of about 13 per cent in pest control products is expected in 1968 and sales will likely continue to expand at about the same rate in 1969.

The value of farm real estate, machinery and equipment, and livestock is expected to increase further in 1968 and 1969 but at diminishing rates due mainly to a leveling off in land price increases in most provinces. The rate of increase in credit used by farmers is expected to be smaller in 1968 than in 1967 and the amount of credit extended may even decline. A slightly smaller percentage increase in farm debts is expected in 1968.

In 1968, crop insurance indemnities are expected to exceed those of 1967. Demand for crop insurance appears to be increasing and total coverage is expected to be greater in 1969 than in 1968.

The composite price index (1935-39 = 100) of goods and services used by farmers is expected to increase in 1968 by more than 6 per cent over the previous year. Prices of all major inputs are expected to increase with the possible exception of prices of feeds and seeds.

GRAINS, FEEDS AND OILSEEDS

Wheat

Situation

World wheat production (excluding Mainland China) was 10,200 million bushels, world trade fell to a level of about 1,950 million bushels, and carryover stocks began to accumulate in 1967-68. The decline in import demand, beginning in 1966-67, continued into 1967-68, and increased supplies in the major exporting countries led to intensified export competition in world markets. International export prices for wheat averaged about 10 per cent lower than the previous year, reflecting the bearish world trade situation. The 1967 International Grains Arrangement became effective on July 1, 1968 and exporters took action to ensure that the provisions of the I.G.A. would be honored.

The 1967 harvest in Canada was a little better than average but sharply below the 1966 record crop. Total Canadian supplies in 1967-68 were 9 per cent below the previous year, but deliveries by farmers were 29 per cent lower. Domestic consumption was up to 167 million bushels due mainly to an increased quantity of wheat fed to livestock, however exports, at 336 million bushels, were 35 per cent below the previous year. Canadian wheat prices averaged \$1.94 per bushel for No. 1 Northern in store the Lakehead, during 1967-68, below the high level of recent years. Initial payments were increased on August 1, 1967 to \$1.70 per bushel for No. 1 Northern at the Lakehead.

Outlook

Opening stocks are up again in exporting countries, and present indications point to a 1968 world wheat harvest in the region of 10,000 million bushels. It is expected that in total, the exporting countries will harvest a record crop. Although most importing countries have good crops, lower levels of production in Britain and Eastern Europe may lead to a slightly increased import demand in 1968-69. There will be ample exportable supplies in 1968-69 and intense competition among exporters is expected to continue with resulting pressures on world wheat prices. Nevertheless the International Grains Arrangement will provide a floor at which world prices can be maintained. Patterns of world trade established in 1967-68 are expected to continue in 1968-69 with only a few significant variations.

Very poor harvesting weather resulted in considerable damage to the quality of the 1968 Canadian crop, although the level of production appears to be above average. With the return of orderly marketing following the implementation of the International Grains

Arrangement, Canada's exports to developed importing countries in 1968-69 could total as much as 180 million bushels and total exports to developing countries could be in the region of 50 million bushels. Many factors will affect the size of purchases, but total Canadian exports to Communist countries could be much higher than the 132 million bushels shipped in 1967-68.

In spite of the forecast for only a slight increase in world trade this year, Canada's exports could increase to 400 million bushels and possibly more. It is the objective of the Canadian Wheat Board to secure 25 per cent or more of world wheat trade. This will mean exports of 1,300 million bushels over the next three years.

The general Canadian wheat outlook for 1968-69 is one of a continued build-up in wheat stocks because production will be slightly greater than domestic and export utilization. If exports reach the levels forecast, producers should be able to market more wheat than last year. However, no increase in acreage seeded in 1969 would seem necessary and a planted acreage somewhat lower than in 1968, would provide adequate supplies to meet anticipated needs in 1969-70.

FEED GRAINS

Situation

World production of feed grains (excluding Mainland China) in 1967-68 is estimated at 470 million metric tons, slightly above the previous year's record. International trade in feed grains in 1967-68 is likely to be slightly below the record 43 million tons traded in 1966-67. World corn prices fell sharply in 1967-68, but other feed grain prices fell only slightly. In spite of a weaker demand for feed grains generally, the volume of international trade in corn was close to the 1966-67 level. Trade in other feed grains was smaller, reflecting changes in the feed grain price relationship favoring corn. Because of a larger supply of corn in the United States, a carryover stocks of feed grains were higher at the end of the 1967-68 season.

Canadian supplies of feed grains were down slightly in 1967-68 as increased beginning carryover stocks and imports from the United States did not quite offset a reduction in Canadian production. Domestic consumption of feed grains remained close to the 1966-67 level, but exports of both oats and barley fell slightly. Ontario corn prices fell relatively more than the prices for western feed oats and barley and therefore corn continued in increased quantities to replace other grains in livestock rations in eastern Canada while barley continued to replace other feed grains in western Canada. These patterns reflect the relative

price advantage of corn and barley over other grains in terms of feeding value.

Outlook

Early indications point to a world feed grain crop in 1968-69 at least as large as last year, as a result of a larger than expected harvest of feed grains in the United States. In view of ample supplies and declining prices for corn, the United States government restored acreage diversion incentives under the Feed Grain Program, but increased yields of all feed grain crops in the United States appear likely to offset any reduction in acreage which may have resulted from such diversions. Satisfactory production in most importing countries will have the impact of depressing, for the second consecutive year, import demand for feed grains with resulting downward pressures on prices and slower world trade. It is expected that world prices for feed grains in 1968-69 will be as low as or lower than 1967-68.

Little change over the previous year is expected in livestock consumption of feed grains in Canada. Larger feed grain production in Canada will be faced with low prices elsewhere, especially in the U.S., and Canadian prices can be expected to be lower in 1968-69 than in 1967-68. Corn will likely continue to be relatively cheaper than other feed grains and consumption of corn can be expected to increase in eastern Canada at the expense of other feed grains, although increased consumption of barley can be expected in Western Canada.

In the longer run, total grain production will increase in Canada, but the emphasis will need to move slowly towards feed grains as domestic livestock consumption continues to rise.

OILSEEDS

World Oilseed Situation and Outlook

World production of oils and fats is expected to establish record levels in 1968 with increases in most edible oils, although flaxseed production is still low compared with levels several years ago. Prices of edible oils on world markets have decreased generally during the 1967-68 crop year. With anticipated high levels of production in main producing countries, world prices of edible oils and oilseeds are likely to remain relatively low for the current year.

Canadian Oilseeds

Situation

Exports of flaxseed, rapeseed and soybeans produced in Canada were lower in 1967-68 at 26.5 million bushels compared with 34 million in 1966-67.

Flaxseed exports were lower by 4 million bushels, rapeseed by 1.5 million and soybeans by 2 million. Imports of soybeans were lower, but soybean oil and meal imports were slightly higher.

The price of flaxseed averaged higher in 1967-68 due to the sharply reduced world availability of industrial oils. Because of generally low world prices for edible oils, the prices of rapeseed, sunflower seed and to a lesser extent, soybeans were reduced.

Production of flaxseed is forecast to almost double to 18.2 million bushels in 1968-69 but rapeseed production is forecast to be slightly higher than last year. With lower yields, sunflower production will likely be sharply reduced. Principal acreage changes were; for flaxseed, a 50 per cent increase to 1.5 million acres; rapeseed, a 35 per cent decrease to 1.05 million acres; soybeans, slightly higher at 295,000 acres from 290,000 acres; and sunflower seed, down slightly to 40,000 from 44,000 acres.

Outlook

The price of flaxseed should remain relatively high, although possibly slightly below last year's levels with a somewhat heavier stock position in North America. A further acreage increase next year does not appear warranted unless production falls sharply below forecast levels.

The price of rapeseed, while showing signs of recovery, is likely to remain at low levels in keeping with world prices for edible oils. With a good domestic and export potential and the total supply position well below that of last year, further acreage reduction does not seem desirable.

The price of soybeans for the coming year should be fairly similar to this year's prices, although some weakness may occur in both the United States and Canada in the fall months of 1968. Canadian production of soybeans still falls far short of Canadian consumption.

Sunflower seed prices have been affected in 1968 by low world market prices for sunflower seed oils and other edible oils, and abundant available supplies. The potential market for sunflower seed however, remains good.

LIVESTOCK AND MEAT

Cattle

Situation

In Canada, inspected cattle slaughter to the end of August 1968 was up by nearly 5 per cent from the corresponding period in 1967 but fed cattle prices averaged only moderately lower. Almost all of the increase in slaughter is accounted for by the increas-

ing fed cattle slaughter. Combined Choice and Good carcasses made up 58 per cent of total inspected slaughter with an average of 30,362 head per week, an increase of 5.3 per cent over the first eight months of 1967.

The sex make-up of the beef kill to the end of August 1968 shows that steer slaughter remained virtually the same as year earlier rates, while heifer and cow slaughter was up 11 and 10 per cent respectively. The increase in heifer slaughter reflects the increasing numbers of heifers going through feedlots. The increase in cow slaughter was mainly in Western Canada and reflects in part the movement of young heifers into herds as replacement females with a corresponding increase in the number of older cows going to slaughter.

In the United States, federally inspected cattle slaughter in the first eight months of 1968 was 4 per cent above year ago levels. In spite of larger productions stronger consumer demand has kept cattle prices higher than in 1967.

Outlook

In Canada, the supply of fed beef in the last quarter of 1968 will be considerably higher than in the same quarter one year ago. For the eight-week period ending September 21, 1968 the weekly average of Choice and Good combined totaled 32,702 head, an increase of 3,820 head from the comparable period in 1967.

In 1969, marketings of fed cattle should be above 1968 levels. With fed cattle prices considerably above the "export basis", the Canadian feedlot operator has recently been in a comparatively favorable position. Furthermore, the outlook in respect to both the supply and the price levels of feed grains is encouraging to the cattle feeder. As a result, a greater demand prevails for feeder cattle to be marketed out of feedlots in 1969.

In mid-September 1968, feeder cattle prices were close to year earlier rates. Prices of good feeder steers and steer calves at Calgary averaged \$27.30 and \$31.10 respectively for the week of September 21, 1968. In view of large feed supplies, the trade expects that prices for replacement cattle may increase a little from September levels.

In the United States fed cattle marketings in the 1968 fall period are expected to be well above 1967 fall levels. With abundant supplies of feed grains and lower feed costs, marketings of fed cattle in 1969 may show some increase over 1968.

For the week of September 21, 1968, Choice steer prices at Toronto averaged \$30.00 per hundred pounds and \$27.35 at Omaha. Fed cattle prices at Toronto during the last quarter of 1968 are not expected to vary greatly from September levels.

Fed cattle marketings have increased rapidly in recent years and this trend is continuing in 1968. In 1965, the weekly average number of Choice and Good steers was 25,939 head and prices stay on an "export basis" with the price of Choice steers averaging \$25.20 at Toronto and \$24.99 at Omaha. During August and part of September 1968, the domestic market absorbed a weekly average of 32,600 Choice and Good carcasses combined, at prices about \$2.00 per hundred pounds over the "export basis". In view of this supply-demand relationship, there may be reason to predict that fed cattle prices will be above the export equivalent for most of the calendar year 1969.

HOGS

Situation

In both Canada and the United States, hog slaughter in the first half of 1968 was larger than for the comparable period in 1967 and hog prices were correspondingly lower.

In Canada, gradings to the end of September 1968 were nearly four per cent above 1967 levels. The pattern of hog slaughter changed sharply in July 1968 when slaughter went below the level of the same month a year earlier for the first time since August, 1966, a period of 22 months. In August and September slaughterings continued below year earlier levels by 5 and 6 per cent respectively. The pattern of hog slaughter between Eastern and Western Canada followed an unusual trend with a sharp reduction in the East beginning in June while the West registered an increase over 1967 for each of the first nine months.

In the United States, the level of hog slaughter during the first eight months of 1968 has not been consistent. While total inspected slaughter increased by approximately 5 per cent, March and June slaughter was down from the 1967 level by 7 and 1 per cent respectively.

Outlook

Hog gradings in Canada for the first half of 1968 were above year earlier levels but are expected to average 5 to 7 per cent below 1967 gradings for the last half of the year. For the year 1968, gradings will likely average close to the high level of 1967.

Gradings in Canada in 1969 are expected to continue below the levels of 1968 for at least the first three quarters. The total gradings for the year will likely total below those in 1968.

According to the United States Department of Agriculture, hog slaughter in the United States is expected to approach year earlier slaughter through the fall period of 1968 and possibly drop below. Reports of producers' intentions indicate that hog

slaughter during the first half of 1969 will again rise above last year's level. The 1968 fall pig crop (June-November) is reported to be up by 5 per cent. This planned increase in hog production reflects the more favorable hog-corn price ratio in the first half of 1968, which averaged nearly 18 to 1 compare with 15.3 to 1 a year earlier. In late September the ratio was nearly 20 to 1. These advances in the ratio have been largely due to substantially lower corn prices rather than higher hog prices. In view of the more favorable ratio some increase in the 1969 spring pig crop is probable. This may lead to heavy market supplies in the U.S. during the fall of 1969.

For the week ending September 20, 1968, the average price for live barrows and gilts at eight Corn Belt markets was \$20.25 per hundred pounds, and at Toronto, \$34.63 per hundred pounds for Grade A carcasses. During the fall quarter of 1968, hog prices are expected to be lower than September levels as slaughter rises seasonally, possibly in the \$32 to \$33 range at Toronto. Allowing for the relationship between hog prices at Chicago and Toronto, price levels may not show any sizeable increase from fall levels until the usual seasonal rise in the summer of 1969.

DAIRY PRODUCTS

Situation

The Canadian dairy industry is adjusting to a changing environment through structural improvements being made at all levels of production and distribution. The number of milk shippers continues to decline. The number of milk cows at June 1, 1968, was estimated at 2,616,000 head—a decrease of 2 per cent from the previous year. There was an increase of about two per cent in the number of dairy heifers being raised mainly for milking purposes. Total milk production in 1968 is estimated at 18.15 billion pounds—about one per cent below the previous year. Milk production and milk utilization patterns have remained fairly constant since 1961.

Fluid sales of milk and cream are estimated at 5.4 billion pounds, up 1.7 per cent from 1967. Volume sales of partly skimmed milk in 1968 were almost double the sales in 1964. Creamery butter production declined for the sixth consecutive year. Output is expected to be around 320.5 million pounds, 9 million pounds less than the previous year. Domestic consumption of creamery butter is likely to be about 328 million pounds, down about 8 million pounds from 1967. Production of cheddar cheese will be about 161 million pounds—almost the same as in 1967. Domestic consumption of all cheeses is expected to reach a

record high, mainly due to increases in specialty-type cheeses. Exports of cheddar cheese in 1968 will be around 30 million pounds. Production of ice cream mix was slightly below the peak of 28 million gallons reached in 1967. Concentrated milk products utilized less milk in 1968 than in 1967, due to a reduction in output of whole milk powder. Consumption of evaporated and condensed whole milk is expected to increase slightly. Production of skim milk powder is expected to reach a record high of about 350 million pounds and consumption will be about 160 million pounds. Exports of skim milk powder may exceed 100 million pounds.

Dairy Support Policy

The Federal government, through the Canadian Dairy Commission, supports Canadian dairy producers by means of direct subsidy payments to producers of manufacturing milk and cream and through offer-to-purchase programs for certain dairy products. The dairy support program for the 1968-69 support year was designed to allow manufacturing plants to pay producers approximately \$3.54 a 100 pounds of milk testing 3.5 per cent butterfat. These returns for the domestic market were supplemented by a direct payment to producers at the rate of \$1.31 a 100 pounds of milk testing 3.5 per cent butterfat, and an equivalent rate for butterfat in cream. The 1968-69 policy also provides for adjustments in subsidy quotas and a payment to those producers who were not able to participate in the subsidy quota program.

Outlook

With policy emphasis on rationalization of the industry at the farm level and on price stabilization of dairy products on the domestic market, little change in production and consumption patterns is likely to occur in 1969. Assuming continuation of present dairy policy, milk production will be at about the same level as in 1968. Total fluid sales are expected to increase by about 100 million pounds. Butter production is not likely to show much change from 1968 and output of cheddar cheese is expected to decline slightly. No gains are foreseen in the production of concentrated milk products. Output of ice cream mix will likely increase. A continued rise in consumption of natural cheeses is anticipated; however, the decline in the consumption of creamery butter is likely to continue. Canada's annual supplies of skim milk powder, surplus to domestic requirements, are expected to be substantial for a number of years. These supplies will be available for commercial exports and food aid.

POULTRY MEAT AND EGGS

Chicken

Situation

Marketings of chicken at registered stations in Canada in 1968 will likely total 475 million pounds, eviscerated basis, compared with an output of 458 million pounds in 1967 and an annual average output of 317 million pounds in 1961-65. The percentage gain in 1968 output over 1967 and from the 1961-65 annual average will be about 3 and 49 per cent respectively. The increase in chicken production in Canada in 1968 from the level of the previous year was the smallest since 1962.

A reduction in chicken marketings in 1968 occurred during the first half of the year, and was a continuation of the cutback that had occurred in the last half of 1967. Markets for broiler and roaster chicken in Canada from January to August in 1967 were generally over supplied. Cold storage stocks of chicken had accumulated to the very high level of 21.9 million pounds at July 1, 1967, and live and wholesale prices had declined to comparatively low levels in the summer of 1967. The reduction in production in the last half of 1967 had the effect of reducing freezer stocks to about normal levels and of raising chicken prices to comparatively high levels by the beginning of 1968. Live prices of No. 1 broiler chicken at Toronto rose from a low of 19.0 cents per pound in September, 1967 to a high of 21.5 cents per pound in August, 1968. A similar situation occurred at other leading live broiler chicken markets in Canada during this period.

Monthly marketings of broiler chicken at registered stations in Canada rose above year ago levels in July, and marketings are expected to total 222 million pounds in the last half of 1968, up by 10 per cent from marketings in the same period of 1967. If so, broiler chicken marketings in 1968 will total 420 million pounds compared with marketings of 407 million in 1967 and annual average marketings of 273 million pounds in the 1961-65 period.

Monthly marketings of roaster or heavy chicken at registered stations in Canada advanced beyond year ago levels in April, 1968, and marketings will likely remain larger than in 1967 for the rest of this year. For the year, output of heavy chicken is estimated to total about 55 million pounds, up moderately from marketings of 51 million pounds in 1967.

Outlook

Production of chicken in Canada in 1969 will likely rise by about 20 to 30 million pounds (4 to 7 per cent) from marketings of 475 million pounds in 1968. This increase is considerably less than the annual average

rate of increase of 10 per cent since 1963. The extent of the increase in chicken production will be determined mostly by the competitive supply of red meats, and especially of the supply of pork and pork products. Since Canadian hog marketings are forecast to remain below year earlier levels in the first half of 1969, the percentage rise of chicken production in the first half of 1969 is expected to exceed the gains in output during the last half of the year.

Turkeys

Situation

Marketings of domestic turkeys at registered stations in Canada will likely total about 184 million pounds in 1968, down by 2 per cent from Canadian marketings of 188 million pounds in 1967, and up by 36 per cent from annual average marketings of 135 million pounds in the 1961-65 period. All of the small reduction in turkey marketings in 1968 is expected to occur in the output of heavy turkeys while broiler turkey marketings (10 pounds and under, eviscerated weight basis) are estimated to equal the output of this class in 1967.

Broiler turkey marketings rose above year earlier levels in July, 1968, and are expected to remain larger for the rest of this year. Broiler turkey marketings in this period are estimated to total 36.1 million pounds, up by 4.1 million pounds, or by 13 per cent, from the volume of marketings in the same period of 1967. The upturn in broiler turkey production, as measured by placement of broiler poults, was quite sharp during July and August, partly because of expectations of a strong turkey market during the Christmas Season. Prior to that time, live broiler turkey prices could advance by 2 to 3 cents from current levels.

Production of heavy turkeys in Canada in 1968 was cutback from 1967 levels by 8.4 per cent, according to reports from registered hatcheries in the cumulative totals of poults placed from January to July inclusive. This cutback was a reflection of the uncertainty that resulted from the poor turkey markets that prevailed in North America in the later part of 1967 and in the first half of 1968. In 1967, United States turkey production was extremely large, and turkey markets in that country became very weak.

In the second half of 1968, marketings of heavy hens (over 10 and under 16 pounds) are estimated to total 33.6 million pounds compared with Canadian heavy hen marketings of 36.0 million pounds in the same period of 1967. In the same period, Canadian marketings of heavy toms (16 pounds and up) are estimated to total 64.7 million pounds compared with Canadian heavy tom marketings of 69.6 million pounds in the same period last year.

Due to the cutback of heavy turkey production in Canada in 1968, imports of turkeys in 1968 could exceed the volume of import in 1967. However, turkey prices in the U.S. are likely to rise prior to the heavy demand period in order to ration reduced prospective supplies among various uses in that country. Although live heavy hen imports into Canada from the United States were substantial in August, it may become increasingly difficult to obtain additional turkeys at rising price levels expected in that country. As a result, live turkey prices in Canada during this period will be at or near an import basis in relation to U.S. price levels, and are expected to advance rather strongly prior to the Holiday Season.

Outlook

Projected demand for turkeys in Canada in 1969 indicates the need of an increase of 10 to 20 million pounds from output levels in 1968, up by more than five per cent. The size of the increase will depend to a great extent on the 1968 fall market situation. If the demand and price situation is as strong as expected, cold storage stocks at January 1 will be below normal levels. That will boost confidence in the 1969 outlook, and will likely result in a continuation of the higher trend now evident in broiler turkey production. Heavy turkey production is also likely to rise in 1969, but what the percentage increase will be, or should be, will be more evident upon having the cold storage stocks statistics at January 1. The lower level of feeding costs in 1968, as compared with feed costs in 1967, are expected to prevail during 1969.

The supply and price outlook for turkeys in the United States for 1969 is still rather vague, although production is likely to be up from 1968 output. Turkey markets in the United States were over produced in 1967 and a similar situation occurred in 1961. Sharp cutback of production followed in 1962 and 1968. On the basis of past experience from 1963 to 1966, U.S. turkey production in 1969 will be about in line with market requirements in that country.

The market demand for turkey in Canada in 1969 will likely approximate 225 million pounds, eviscerated basis. Growth in the demand for broiler weight turkeys will likely continue at a faster rate than the demand for heavy turkeys.

Eggs

Situation

Egg marketings at registered stations by producers in Canada will likely total about 8.7 million cases in 1968 compared with marketings of 8.5 million in 1967 and average annual marketings of 7.3 million cases during the 1961-65 period. This will represent a percentage increase in 1968 egg marketings of 2 per cent

over deliveries in 1967 and 19 per cent up from average annual marketings in 1961-65. All of the rise in 1968 egg production and marketings occurred in about the first nine months of this year. Egg production in Canada reached a cyclical peak during the 1967-68 winter season and has been declining slowly but steadily since that time.

Egg marketings at registered stations in Canada in the second half of 1968 are expected to total 4.2 million cases, almost equal to egg marketings in the same period of 1967, but down both cyclically and seasonally from the marketings of 4.5 million cases in the first half. In the last quarter of 1968, egg production and marketing are likely to drop below year ago levels for the first time since December, 1966, the date about which the upward phase in the current egg marketing cycle began.

Egg prices to producers in Canada during the first half of 1968 remained stable, but at a relatively low level. The weighted average price to producers for all grades marketed at registered stations averaged 26.9 cents per dozen during January to June, 1968, down 2.1 cents from average prices in the same period a year earlier. Prices began to rise sharply toward the latter part of July and have been climbing steadily since that time. For the week ending September 14, 1968, the weighted price to producers for all grades in Canada was 39.5 cents per dozen, up by 11.8 cents from the same date in 1967.

Similar changes in the egg supply and price situation occurred in the United States in 1968 as have occurred in Canada. Although egg prices in Canada were relatively low during the period from January to July, shell egg imports into Canada from the United States continued to occur, but at a considerably reduced volume in relation to the same period a year earlier.

In spite of the larger supply of eggs in Canada in the first nine months of 1968, the volume of liquid egg production in registered stations in Canada, at 19.7 million pounds in this period, was down by 17 per cent from output of 23.8 million in the same period of 1967.

Imports into Canada of frozen egg products in the first nine months of 1968 were very small. As a result, inventories of egg products in Canada at the present time are not unduly large, and much larger imports of breaking stock and/or of egg products are expected in the next several months.

Placements of chicks from registered hatcheries in Canada for commercial layer replacement purposes fell below year ago levels in June, 1967 and remained sharply lower until July 1968. Consequently, the size of the national laying flock in 1969 is expected to be smaller than in 1968.

Outlook

Canadian egg marketings at registered stations in 1969 will likely total about 8.2 million cases, down by 6 per cent from total marketings in 1968. The pattern of seasonal distribution of egg marketings and prices in 1969 will likely resemble the pattern in 1966, except that egg production in the last half of 1969 could be comparatively larger and prices lower than was the situation in 1966 when a marked egg shortage occurred. Hatchery orders and placements of chicks during August were up from a year ago and this higher trend is expected to continue. Although the main hatching season is now past, and fall and winter placements are comparatively small, they will nevertheless boost layer numbers and egg production in the later months of 1969 when supplies are likely to be relatively short.

The expected reduction of Canadian egg production in 1969 is expected to result in a much higher level of average egg prices than in 1968, especially until August. A similar outlook is forecast for the United States. Higher price levels in Canada will likely attract shell egg imports from the United States to a greater extent in 1969 than was the situation in 1968. Egg product imports from other countries are also likely to rise sharply in 1969.

One of the main dangers in the 1969 egg market is that it may rise too much and encourage a too rapid expansion of egg production by 1970. Chick placements for egg production in 1969 should probably be about 24 million in order to limit egg production in 1970 to market requirements at remunerative egg prices to producers. However, Canadian egg producers will have to remain competitive with production and prices in the United States or risk losing a portion of their Canadian market to a larger volume of egg imports from that country.

FRUITS AND VEGETABLES

Situation

Apples—The 1968 apple harvest in Canada is estimated at 909 million pounds or 18 per cent less than the record crop in 1967 and about the same as the 5-year average production during 1961-65. Early forecasts indicate a decline in all apple producing provinces. The United States crop is expected to be about 5,400 million pounds, about the same as last year, but 8 per cent below the average of 1962-66. The total North American crop will be 200 million pounds (or 3 per cent) less than last year. Total European Economic Community production is estimated at 12,700 million pounds or 18 per cent less than last year. Apple production in England and Wales was estimated at 453 million pounds, up 6 per cent from the poor crop of

last year, but still below average. There was a decline in exports to Britain of both fresh apples and processed solid pack apples. Canada's share of the British market for imported fresh apples declined to 6.9 per cent in 1967-68 as compared with the previous 5 year average of about 10 per cent. Exports of fresh apples to Britain from France increased to five times those of 1965-66 and are taking a growing share of the total import quota. Total exports of solid pack apples which had been increasing in recent years declined last year. During the first six months of 1968 Canadian exports of solid pack canned apples were slightly below those of the previous year, ranking Canada third, after Japan and Italy, among suppliers to Britain.

Potatoes—The 1968 production of potatoes in Canada is estimated at 4,580 million pounds, 0.4 per cent below the 1961-65 average and about 2 per cent less than last year. A reduction in acreage and lower yields in 1968, as compared with last year, contributed to this drop in production. The United States production of fall potatoes is forecast at 21,050 million pounds, or 9 per cent below the 1967 crop. Acreage and expected yield are also less than a year earlier. However, as a result of the intensive development of the Columbia River Basin in Washington State, production rose from 590 million pounds in 1963 to 1,550 million pounds in 1968 or 149 per cent of the 1963-67 average. Washington State "stripper" potatoes, i.e., those which meet minimum Canadian grade requirements and which remain after larger sizes are taken from the top United States grades and sold at premium prices, were exported to Western Canada. They had a depressing effect on sales of Canadian potatoes. By mid-September a value for duty was placed on potatoes entering Western Canada.

Other Fruit—Estimates of the 1968 production for other fruit were smaller, with some exceptions, than the previous year. Total cherry production, particularly sour cherries and that for blueberries was down. British Columbia's production of peaches was considerably smaller. However, total peach production increased. In Ontario, peach production was 54 per cent higher than in 1967. There were also increases for plums, prunes and apricots.

Other Vegetables—A good crop of onions and carrots and at least the same level of production for other fresh table vegetables is expected for 1968. The contracted acreage for tomatoes, and green and wax beans for processing dropped in 1968 while that for other main vegetables increased. Commodities showing upward trends in exports were tomatoes, rutabagas, canned corn, canned peas and frozen vegetables.

Imports of fresh vegetables continued to increase. No statistical evidence at mid-year indicated that sterling devaluation has seriously affected the volume of processed exports with the exception of frozen peas.

Outlook

Apples—The disposition of fresh apples in North America looks good because of the small crops in Canada and the United States, and there will probably be slightly higher prices. Canadian consumption of processed apples is likely to increase more. The smaller crops in several of the countries in the European Economic Community will likely result in a reduction of total exports from that area into the British market. Nevertheless, Canadian exporters of both fresh and processed apples are apprehensive that the devaluation of the pound sterling will discourage imports from Canada. However, the below average United States crop should result in the continuation of the strong demand for Canadian apples in that market.

Potatoes—The expected reduction in North American production should lead to increased shipments of both table and seed stock to the United States. This will most likely cause an increase in market prices for fresh potatoes in Canada. Seed exports to Argentina, Venezuela, Cuba, Greece, Italy and the West Indies will be about the same as those for last season.

Other Fruit—The demand for fresh fruit is expected to remain strong with the smaller fruit crop exerting some upward pressure on prices. The small peach crop in British Columbia and a heavy demand from the fresh market in Ontario will result in a small domestic pack. Imports of canned peaches and pears will likely continue at about the same level as previous year.

Other Vegetables—The expected large crop of onions and carrots may result in increased sales to the United States and possibly to Britain. Prices will likely be somewhat lower particularly on the domestic market. The market for canned wax beans in West Germany will decline.

SPECIAL CROPS

Sugar Beets

Situation

There were no sugar beets contracted in Ontario in 1968 but increases in acreage in the other three provinces which grow sugar beets almost made up the difference. Crop prospects suggest a yield of beets and of sugar which may be only slightly below that

of a year ago. Price support was continued for the 1968 crop at a level which is equivalent to that for the 1967 crop. World prices of raw sugar continued at very low levels.

Outlook

It is probable that there will be a stabilization payment on the 1968 crop because of low raw sugar prices. Because of improved returns for by-products during the base period of support and because of the method of sugar beet purchase in Quebec, final grower returns from the 1968 crop are likely to average above the support level.

Dry Peas

Situation and Outlook

Although the acreage of dry peas increased, 1968 production, compared with 1967, declined because of poor seeding and harvesting conditions in 1968. Prices will vary due to quality, but it is expected that the average price will be higher for the 1968 crop than for that of 1967.

Dried Beans

Situation and Outlook

Acreage, yield and production increased in 1968 over 1967. However, due to poor harvesting conditions in 1968, quality will be lower than a year ago and the price per hundred pounds will be slightly lower.

Tobacco

Situation

The acreage of tobacco harvested in Canada in 1968 declined from the record 1967 level but was still above the acreage harvested in 1966. As usual, the largest part of this tobacco was flue-cured, with smaller acreages of special types. There was some increase in the Quebec acreage of cigar filler tobacco compared with 1967 although not up to the 1966 acreage.

Acreage of flue-cured tobacco continued to increase in Quebec and the Maritimes, but the expansion was over-shadowed by the downward variation in the much larger Ontario acreage. Ontario growers planted closer to their allotted acreage in 1968 than in 1967 as they tried to utilize recent extensive new investment. The 1968 acreage allotment by the Ontario Flue-cured Tobacco Growers' Marketing Board contemplated production of 205 to 210 million pounds green weight. This included 73 million pounds as an export target, besides provision

for domestic manufacturing. Preliminary crop forecasts were in line with production goals.

Bulk-curing units and other technical developments being introduced, are making significant changes by lessening reliance of the industry on hand labor.

Use of cigarette tobacco in Canada increased only one per cent in 1967 and the rate of use may show a downward trend in the latter part of 1968. This is the result of a number of factors, including changes in the style of cigarette as well as higher taxes and higher prices. World demand for cigarette tobacco continues to increase slowly and stocks are large. Heavy stocks held under the United States price support program have a direct bearing on world markets.

Outlook

Domestic requirements for flue-cured tobacco seem to have stabilized so that provision of about 140 million pounds from the 1968 crop and from the 1969 crop seems appropriate. With average yields, acreage in 1969 similar to that of 1968 would be sufficient to maintain sales but would not provide supplies for possible increases in sales in Britain or for development or recovery of other export markets.

CEREAL, OILSEED AND FORAGE CROP SEEDS

Situation

Acreage of pedigreed spring wheat amounted to 145,000 acres compared with 325,000 acres in 1967 and production was forecast at about 4 million bushels compared with about 9 million bushels in 1967. Manitou accounted for 86 per cent of the total crop. Winter wheat acreage and production decreased slightly from 1967 with production estimated at about 1 million bushels. Durum wheat acreage and production were higher than a year ago. Acreage and estimated production of pedigreed oats were well above 1967 levels, with an estimated production of about 6 million bushels. Pedigreed barley production also increased significantly over 1967 with production placed at 3 million bushels, nearly twice that of a year ago. Production of pedigreed oilseed crops was higher than a year ago, particularly rapeseed. The quality of the cereal crops and flax

was seriously affected by frost damage and poor harvest weather in Western Canada. Growing and harvesting conditions in Eastern Canada were good and the cereal crops yielded above average and are of good quality. Hybrid corn seed acreage, at more than 11,000 acres, was higher than a year ago, but yields were lower. Production of pedigreed white beans was less than in 1967.

Seed production of both commercial and pedigreed legume forage crops in Western Canada, where most of them are produced, was much less in 1968 than in 1967. This was because of a very poor seed set and bad harvesting weather. Seed production of most of the grass crops was not as seriously affected by weather conditions as were the legumes, and the seed crops, with some exceptions, were somewhat larger than a year ago.

Outlook

In spite of much smaller production of pedigreed seed of spring wheat, supplies should be sufficient to meet expected domestic demand in 1969. Because of the extensive frost damage and poor harvesting conditions, there may be local shortages of good quality pedigreed seed of some varieties of oats and barley in Western Canada. However, overall supplies should meet the needs of that region. In Eastern Canada, there is an abundance of good quality seed of the recommended varieties.

With the exception of alfalfa, there will be adequate seed of the major forage crop kinds to meet domestic needs.

Retail prices for the major forage crop seeds are expected to be somewhat higher in 1969 than in 1968. The export market for forage seed has not strengthened from a year ago, but because of the small production in Canada, no difficulty will be encountered in marketing the surplus supplies, with the exception of creeping red fescue and meadow fescue. There is expected to be some increase in acreage in forage crop seed production in Western Canada owing to slightly improved prices to growers for most kinds and the increasing interest in cash crops. Also, the demand in Europe for certified seed of adapted varieties is expected to result in some expansion of acreage in varieties being grown in Western Canada under the Organization for Economic Co-operation and Development Herbage Seed Scheme.

AGRICULTURAL STABILIZATION PROGRAMS

AGRICULTURAL PRODUCTS MARKETING ACT, 1949

The Agricultural Products Marketing Act, passed in 1949 and amended April 12, provides for the extension, to interprovincial and export trade, of all or any powers exercised by provincial boards established under provincial legislation for the marketing of agricultural products within the province. The Governor in Council may grant further authority to fix, impose and collect levies or charges from persons engaged in the production or marketing of the whole or any part of any agricultural product and for such purpose to classify such persons into groups and fix the levies or charges payable by the members of the different groups in different amounts, to use such levies or charges for the purpose of such board or agency, including the creation of reserves, and the payment of expenses and losses, resulting from the sale or disposal of any such agricultural product, and the equalization or adjustment among producers of any agricultural product of moneys realized from the sale thereof during such period or periods of time as the board or agency may determine.

As at September 15, 1968 the following boards had their authority extended with respect to marketing agricultural products in interprovincial and export trade:

The British Columbia Fruit Board
The British Columbia Coast Vegetable Marketing Board
The British Columbia Interior Vegetable Marketing Board
The British Columbia Egg Marketing Board
The British Columbia Broiler Marketing Board
The British Columbia Turkey Marketing Board
The Alberta Broiler Grower's Marketing Board
The Alberta Turkey Growers' Marketing Board
The Alberta Potato Commission
The Saskatchewan Broiler Chicken Producers' Marketing Board
The Saskatchewan Turkey Producers' Marketing Board
The Ontario-Flue-cured Tobacco Growers' Marketing Board

With respect to Ontario vegetables:

The Farm Products Marketing Board of Ontario
The Ontario Vegetables Growers' Marketing Board

With respect to Ontario greenhouse vegetables:

The Farm Products Marketing Board of Ontario
The Ontario Greenhouse Vegetable Producers' Marketing Board

With respect to Ontario onions:

The Farm Products Marketing Board of Ontario
The Ontario Onion Producers' Marketing Board

With respect to Ontario asparagus for processing:

The Farm Products Marketing Board of Ontario
The Ontario Asparagus Growers' Marketing Board

With respect to Ontario beans:

The Farm Products Marketing Board of Ontario
The Ontario Bean Producers' Marketing Board

With respect to Ontario wheat:

The Farm Products Marketing Board of Ontario
The Ontario Wheat Producers' Marketing Board

With respect to Ontario strawberries and raspberries for processing:

The Farm Products Marketing Board of Ontario
The Ontario Berry Growers' Marketing Board

With respect to Ontario grapes for processing:

The Farm Products Marketing Board of Ontario
The Ontario Grape Growers' Marketing Board

With respect to Ontario fresh grapes:

The Farm Products Marketing Board of Ontario
The Ontario Fresh Grape Growers' Marketing Board

With respect to Ontario fruit for processing:

The Farm Products Marketing Board of Ontario
The Ontario Tender Fruit Growers' Marketing Board

With respect to Ontario fresh fruit:

The Farm Products Marketing Board of Ontario
The Ontario Fresh Fruit Growers' Marketing Board

With respect to Ontario hogs:

The Farm Products Marketing Board of Ontario
The Ontario Hog Producers' Marketing Board

With respect to Ontario eggs and fowl:

The Farm Products Marketing Board of Ontario
The Ontario Egg and Fowl Producers' Marketing Board

With respect to Ontario broiler chickens:

The Farm Products Marketing Board of Ontario
The Ontario Broiler Chicken Producers' Marketing Board

With respect to Ontario cheese:

The Milk Commission of Ontario
The Ontario Milk Marketing Board

With respect to Ontario milk:

The Milk Commission of Ontario
The Ontario Milk Marketing Board

The Quebec North-West Pulpwood Producers Board

The Rimouski-Matapedia Pulpwood Producers' Board

The Rimouski-Matane Wood Producers' Board

The Gaspesia Pulpwood Producers' Board

The Levis and Bellechasse Pulpwood Producers' Board

The Ste. Anne de la Pocatière Region Wood Producers' Board

The Pontiac Forest Products Producers' Board

The Gatineau Valley Forest Products Producers' Board

The Lotbinière Forest Products Producers' Board

The Megantic Forest Products Producers' Board

The Rimouski-Temiscouata Forest Products Producers' Board

The Rimouski-Wood Producers' Syndicate

The Eastern Townships Region Wood Producers' Syndicate

The Wood Producers' Syndicate of Quebec South

The Quebec South Maple Sugar and Syrup Producers' Board

The Hull Region Milk Producers' Board

The Quebec Industrial Milk Producers' Marketing Board

The Quebec Apple Growers' Marketing Board

The Quebec Flue-cured Tobacco Producers' Board

The Eggs for Consumption Producers' Federation

The New Brunswick Hog Marketing Board

The Nova Scotia Marketing Board, with respect to wool

The Nova Scotia Hog Marketing Board

The Nova Scotia Chicken Marketing Board

The Prince Edward Island Potato Marketing Board

In addition, the following Boards and authority as at September 15, 1968 to collect levies as detailed below:

The Ontario Wheat Producers' Marketing Board

Authority to collect levies not to exceed the rate of 20¢ per bushel of wheat marketed, to be in effect for the period up to June 30, 1969.

The Ontario Milk Marketing Board

Authority to collect levies not to exceed the rate of 5¢ for each 100 pounds of milk marketed, to be in effect for the period up to March 31, 1969.

The Ontario Grape Growers' Marketing Board

Authority to collect levies not to exceed the rate of \$5.00 per ton of grapes marketed, to be in effect for the period up to December 31, 1968.

The Ontario Tender Fruit Growers' Marketing Board

Authority to collect levies, not to exceed the rate per ton marketed in the case of Bartlett pears or cherries, \$4.00 and, in the case of Kieffer pears, peaches or plums, \$2.00, to be in effect for the period up to December 31, 1968.

The Nova Scotia Chicken Marketing Board

Authority to collect levies not to exceed the rate of one-quarter cent per pound live weight of chicken processed and marketed, to be in effect for the period up to January 31, 1969.

The Nova Scotia Hog Marketing Board

Authority to collect levies not to exceed the rate of five cents per hog marketed, to be in effect for the period up to September 1, 1969.

AGRICULTURAL STABILIZATION ACT

COMMODITIES UNDER THE AGRICULTURAL STABILIZATION ACT AND THE CANADIAN DAIRY COMMISSION 1968-69

Commodity	Basic grade and market	Unit	Base price latest 10 year average	Per cent of base price	Support price	Effective period and method of support
			dollars	per cent	dollars	
Named Commodities:						
1. Eastern Grains						
(a) Wheat.....	No. 2 C.E. or better 14 per cent moisture delivered to Ontario elevators	bushel	1.76	80	1.41	July 1/68 to June 30/69
(b) Oats.....	"	bushel	0.74	80	0.59	July 1/68 to June 30/69
(c) Barley.....	"	bushel	1.16	80	0.93	July 1/68 to June 30/69
2. Cattle (steers live).....						
	Good, delivered Toronto stockyards	hundred pounds	24.30	80	19.44	April 1/68 to Mar. 31/69 Deficiency payment
3. Sheep (lambs live).....						
	Good, national basis	hundred pounds	20.56	91.4	18.80	April 1/68 to Mar. 31/69 Deficiency payment
4. Hogs (carcass warm dressed weight)						
	Grade A national producer price	hundred pounds	28.33	80	22.66	Jan. 1/68 to Dec. 31/68 Deficiency payment
5. Butter.....						
	Canada First Grade creamery, 40-93 score or higher, Montreal	pound	—	—	0.63	April 1/68 to Sept. 29/68 0.65 effective Sept. 30/68 Offer-to-purchase, C.D.C.
6. Cheese.....						
	Canada First Grade waxed cheddar, basis delivered Belleville or Montreal	pound	0.3696	80	0.42 to 0.47	April 1/68 to Mar. 31/69 Offer-to-purchase, C.D.C. (seasonal price-range)
7. Eggs.....						
	National weighted average producer price for Grade A Large	dozen	0.3486	Not yet announced		Oct. 1/68 to Sept. 30/69
Designated Commodities:						
1. Manufacturing Milk and Cream						
	Payment on butterfat basis	hundred and 3.5 per cent butterfat	—	—	4.85	April 1/68 to Mar. 31/69 Direct payment to producers of \$1.31 on manufacturing milk (37.42¢ per lb. butterfat) of which 15¢ withheld on milk and 1¢ on butterfat for export aid.
2. Sugar Beets.....						
	National average grower returns per standard ton of beets yielding 250 lbs. of sugar	ton	13.61	117.4	15.98	Sept. 1/68 to Aug. 31/69 Deficiency payment
3. Wool.....						
	Representative grades	pound	0.4057	147.9	0.60	April 1/68 to Mar. 31/69
4. Potatoes.....						
	Eligible acreage grown in Canada	acre	\$1.99 per cwt.	90	\$12.50 per ½ acre	1967 crop, direct payment on over one acre, \$400.00 maximum.

SELECTED INDEXES: FARM COSTS, FARM PRICES, WHOLESALE PRICES, CONSUMER PRICES, PRODUCTION

(All indexes shown are official, seasonally unadjusted indexes published by the Dominion Bureau of Statistics.)

	Index of Prices Paid by Farmers					Index of Prices Received by Farmers	Wholesale Price Indexes					Consumer Price Indexes		Production Indexes		
	Composite (excluding living costs)	Farm machinery	Taxes and interest rates		Farm wage rates		Canadian Farm Products					Non-farm products	All items	Food	Industrial	Farm
			General	Field				Animal								
				All			Field		Animal							
	1935-39 = 100					1949 = 100					1961 = 100 1949 = 100					
1947.....	170.4	126.3	125.0	341.4	215.8	163.3	192.2	184.1	200.2	160.3	84.8	79.5	48.9	100.6		
1948.....	197.6	141.6	131.3	371.2	255.8	194.3	232.1	200.6	263.7	184.9	97.0	97.5	51.5	104.9		
1949.....	204.1	158.3	138.7	373.3	265.4	198.3	228.7	191.9	265.4	190.9	100.0	100.0	53.4	100.0		
1950.....	210.4	165.1	144.3	368.7	260.8	211.2	236.7	191.9	281.4	204.2	102.9	102.6	57.3	110.4		
1951.....	230.0	186.8	151.8	416.6	296.8	240.2	268.6	200.4	336.9	233.2	113.7	117.0	62.6	122.3		
1952.....	243.1	195.4	161.4	445.5	274.4	226.0	250.2	223.0	277.5	226.0	116.5	116.8	65.3	140.0		
1953.....	239.8	196.7	168.2	449.1	250.4	220.7	221.6	179.4	263.8	223.3	115.5	112.6	70.1	130.2		
1954.....	237.2	197.9	174.6	441.2	236.8	217.0	213.6	170.9	256.3	219.6	116.2	112.2	70.0	104.0		
1955.....	238.3	198.8	177.2	439.7	232.7	218.9	212.6	180.1	245.1	225.9	116.4	112.1	77.7	127.1		
1956.....	247.6	209.4	184.7	470.3	234.6	225.6	214.2	181.6	246.9	235.7	118.1	113.4	85.7	136.5		
1957.....	255.9	223.8	191.9	501.4	234.2	227.4	213.6	169.2	258.0	236.0	121.9	118.6	87.2	117.0		
1958.....	259.9	236.1	196.7	513.2	245.5	227.8	222.9	171.4	274.5	233.0	125.1	122.1	86.7	128.2		
1959.....	269.5	247.8	204.5	538.2	247.4	230.6	223.9	176.1	271.6	237.0	126.5	121.1	94.3	127.3		
1960.....	276.7	253.5	214.5	555.3	250.0	230.9	226.6	189.1	264.1	230.0	128.0	122.2	96.1	133.7		
1961.....	282.2	260.7	220.6	566.0	261.2	233.3	230.9	191.7	270.0	239.1	129.2	124.0	100.0	116.1		
1962.....	290.7	268.1	228.0	576.1	272.0	240.0	240.8	195.5	286.0	244.8	130.7	126.2	109.5	147.6		
1963.....	298.6	272.9	239.1	600.6	268.4	244.6	236.3	197.2	275.4	248.0	133.0	130.3	116.5	162.1		
1964.....	308.6	279.6	247.4	627.5	265.8	245.4	232.7	198.2	267.3	252.2	135.4	132.4	128.1	151.2		
1965.....	321.8	284.9	259.1	677.0	282.2	250.4	249.8	210.3	289.3	257.2	138.7	135.9	139.1	162.1		
1966.....	343.2	293.1	272.2	764.4	307.0	259.5	265.6	209.7	321.5	262.5	143.9	144.5	148.9	182.3		
1967.....	365.3	302.2	288.1	842.4	305.0	264.1	262.0	198.7	325.3	269.0	149.0	146.4	151.7	159.6		
1967																
April.....	370.8	302.8	288.1	873.3	307.5	262.7	262.1	204.2	319.9	267.5	147.8	144.0	153.2	—		
May.....	—	—	—	—	309.2	263.6	266.6	205.4	327.8	267.4	148.1	143.7	152.8	—		
June.....	—	—	—	—	313.3	264.1	269.1	207.4	330.7	267.4	148.8	144.8	156.0	—		
July.....	—	—	—	—	310.2	263.9	266.8	208.6	325.0	268.7	150.2	148.5	141.2	—		
August.....	370.4	302.1	288.1	865.6	300.1	264.8	260.4	190.9	329.8	269.8	150.9	151.2	148.6	—		
September.....	—	—	—	—	298.6	265.1	258.6	186.1	331.2	271.2	150.7	148.5	154.8	—		
October.....	—	—	—	—	298.3	265.3	258.9	186.8	330.9	271.5	150.5	147.8	154.9	—		
November.....	—	—	—	—	294.9	265.3	254.6	186.1	323.1	272.4	151.0	148.0	158.8	—		
December.....	—	—	—	—	295.4	267.1	256.3	186.2	326.4	274.3	151.8	148.6	153.3	—		
1968																
January.....	367.6	313.2	288.1	835.7	293.8	267.1	253.0	189.6	316.3	275.4	152.6	150.4	150.4	—		
February.....	—	—	—	—	293.5	266.9	250.9	186.4	315.4	275.8	152.7	149.8	154.4	—		
March.....	—	—	—	—	291.7	268.0	249.0	185.1	312.9	277.4	153.2	148.7	154.7	—		
April.....	388.9	313.6	288.1	948.8	292.3	267.2	249.0	184.2	313.8	277.3	154.1	149.8	157.7	—		
May.....	—	—	—	—	295.0	268.7	255.5	188.7	322.2	278.2	154.2	148.9	161.7	—		
June.....	—	—	—	—	301.0	270.3	259.9	189.8	330.0	278.8	154.7	149.4	—	—		
July.....	—	—	—	—	—	262.0	191.0	333.1	—	—	155.6	151.9	—	—		
August.....	—	—	—	—	—	265.0	189.2	340.8	—	—	156.0	153.6	—	—		

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CANADIAN FARM ECONOMICS

- Prospects for Increasing Beef Supplies in Canada
J. S. Lohar 1
- Beef Cattle Production in West Central Manitoba
L. M. Johnson 9
- Beef Production on Part-time Ranches on the Interior
Plateau of British Columbia, 1966. *N. D. Turnbull* 19
- Prospects for Strawberry Production in Canada
Raziuddin M. Siddiqui 23
- Policy and Administration of Public Lands in Alberta
with Particular Reference to Agriculture. *T. F. Joyce* 28
- Policy and Program Developments. 33
- Publications. 33

HON. H. A. OLSON, MINISTER—S. B. WILLIAMS, DEPUTY MINISTER

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CANADIAN FARM ECONOMICS

PROSPECTS FOR INCREASING BEEF SUPPLIES IN CANADA (1)

J. S. Lohoar

Of the technical problems remaining unsolved in the production of agricultural commodities, increasing beef supplies is proving the most difficult. Attempts to boost beef production in Europe are resulting in large surpluses of dairy products. In Australia and South America, drought remains a constant problem to increasing cattle numbers. In North America considerable progress has been achieved but compared with other sectors in agriculture the rate of technical advance has not been rapid, especially in relation to the production of feeder cattle and feeder calves.

In contrast with the supply situation, beef is one of the few agricultural commodities for which the demand in the future is likely to show a substantial increase. It is estimated that total beef consumption in Canada in 1980 will be 2,605 million pounds (2). This represents an increase of 64 per cent compared with the 1964-66 period. Recent projections indicate that the output of cattle in Canada will have to increase at an annual rate of about 3 per cent if these requirements in 1980 are to be satisfied (3).

The North American continent now represents the largest single deficit area for beef. In 1967, approximately 870 million pounds were imported, this exceeded shipments to the United Kingdom which traditionally had been the largest importer. A rapid growth in demand accompanied by only a modest rate of technical advance could result in import requirements for beef in North America increasing in the future. It is therefore important that some of the characteristics surrounding the supply situation for beef in Canada should be known together with factors influencing the productivity of the industry. This knowledge will help to maximize beef supplies in the future to avoid any possible shortage on the domestic market and to establish Canada as a more consistent exporter of beef.

In this article, recent trends in the supply of beef in Canada are reviewed together with the factors affecting expansion in cattle numbers. Productivity gains

in the beef industry are also discussed so that areas in which research and extension work may have increased roles in expanding beef production may be identified.

THE SUPPLY OF BEEF

Canadian beef supplies consist largely of domestically produced beef with imports making a relatively small contribution. In 1967, imports amounted to 50 million pounds out of a total disappearance of 1,667 million pounds. Exports totaled 32 million pounds so Canada is approximately self-sufficient, especially when trade in feeder cattle as well as carcass beef is considered.

In view of this heavy reliance on domestic production to meet the demand for beef, it follows that Canadian farms must be the major source of the increased requirements if imports are not to increase. A study of recent trends in beef output together with the factors influencing the quantity of beef produced will indicate whether future increases in demand are likely to be satisfied.

Recent Trends in Beef Production

In contrast with the production of pigmeat and poultrymeat, beef output cannot be expanded rapidly. Beef production is, by nature, a long-term enterprise due to the nine-month gestation period necessary to produce a calf and to the fact that, in most cases, each calving produces only a single calf. In addition, cows are normally two years old or more before producing a calf. This situation contrasts with pigmeat production where approximately eight additions to the total herd can be produced from each sow in the space of six months. The production of broilers and turkeys can be expanded even more rapidly. The relative inflexibility of the supply response possible in the beef industry results in long-term planning being more important to beef producers than to farmers producing other types of livestock products.

TABLE 1—EFFECT OF INCREASED CATTLE NUMBERS AND INCREASED CARCASS WEIGHTS ON BEEF OUTPUT, CANADA, 1954 TO 1967

Item	Unit	Average 1954-59	Average 1960-62	Average 1965-67
Estimated farm output of cattle.....	thousand head	2,368.0	2,495.2	3,469.6
Estimated farm output of beef (cold dressed weight).....	million pounds	1,149	1,289	1,840
Average carcass weight (cold, dressed)....	pounds	485.1	516.4	530.3
		1954-59 to 1960-62	1960-62 to 1965-67	
Change in farm output of beef.....	million pounds	+140	+551	
Amount of change in beef output due to:				
a) increased cattle numbers.....	million pounds	62	503	
	per cent	44	91	
b) increased carcass weights.....	million pounds	74	35	
	per cent	53	6	
c) increased cattle numbers and increased carcass weights.....	million pounds	4	13	
	per cent	3	3	

Source: Calculated from *Livestock and Animal Products Statistics*, Cat. No. 23-203, Dominion Bureau of Statistics.

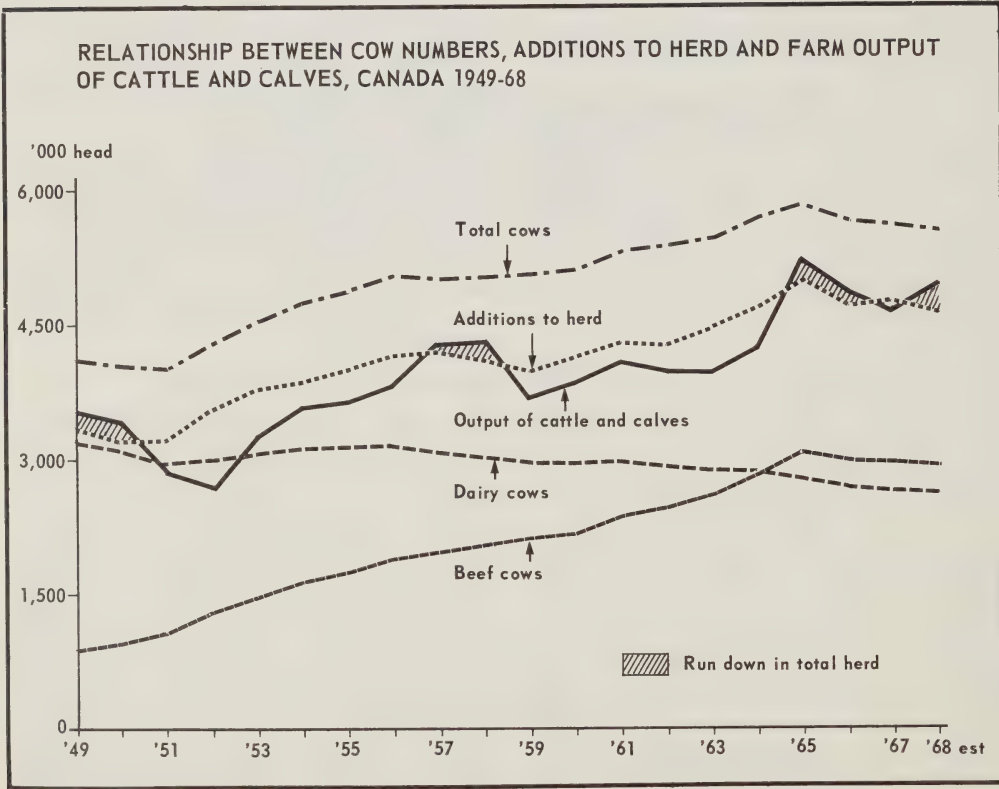


Figure 1

TABLE 2—COW NUMBERS, ESTIMATED FARM OUTPUT AND ADDITIONS TO THE HERD, CANADA, 1949 TO 1968

Year	Cows and Heifers on Farms at June 1			Farm Output of Cattle and Calves	Additions to Herd ^a	Net Change in Total Herd ^b
	Beef	Dairy	Total			
	thousand head					
1949.....	906.8	3,236.8	4,143.6	3,549.3	3,383.9	-165.4
1950.....	961.1	3,119.2	4,080.3	3,414.7	3,214.2	-200.5
1951.....	1,045.7	2,973.0	4,018.7	2,870.4	3,225.8	355.4
1952.....	1,254.0	3,005.5	4,259.5	2,700.3	3,551.3	851.0
1953.....	1,463.0	3,083.5	4,546.5	3,237.9	3,776.9	539.0
1954.....	1,627.0	3,120.5	4,747.5	3,564.0	3,873.0	309.0
1955.....	1,735.0	3,150.5	4,885.5	3,628.7	3,970.7	342.0
1956.....	1,888.0	3,160.0	5,048.0	3,802.4	4,163.4	361.0
1957.....	1,983.7	3,098.0	5,081.7	4,255.4	4,170.4	- 85.0
1958.....	2,011.5	3,028.0	5,039.5	4,296.5	4,107.5	-189.0
1959.....	2,101.6	2,954.7	5,056.3	3,668.1	3,971.1	303.0
1960.....	2,158.8	2,964.8	5,123.6	3,820.8	4,129.8	309.0
1961.....	2,341.0	2,986.8	5,327.8	4,067.9	4,304.9	237.0
1962.....	2,437.0	2,938.5	5,375.5	4,064.4	4,354.4	290.0
1963.....	2,579.3	2,873.0	5,452.3	3,964.4	4,419.4	455.0
1964.....	2,830.1	2,845.0	5,675.1	4,240.5	4,690.5	450.0
1965.....	3,035.0	2,795.0	5,830.0	5,132.9	4,906.9	-226.0
1966.....	2,987.0	2,673.9	5,660.9	4,949.7	4,796.7	-153.0
1967.....	2,968.2	2,668.0	5,636.2	4,633.2	4,659.2	26.0
1968.....	2,920.2	2,616.4	5,536.6	4,897.7	4,597.7	-300.0

^a Estimated farm output plus net change in total herd.

^b Change in total cattle numbers between successive December surveys.

Sources: (1) *Report on Livestock Surveys, June 1, 1968*, Cat. No. 23-004, Dominion Bureau of Statistics.

(2) *Handbook of Agricultural Statistics, Part IV*, Cat. No. 5503-527, Dominion Bureau of Statistics.

In general terms, changes in the output of beef result from variations in the number of cattle produced and changes in average carcass weights. An examination of recent trends in beef output indicates a change in the relative importance of these two parameters (Table 1). During the period 1955-61, increased output reflected both increased numbers and heavier carcass weights. Heavier carcass weights contributed 53 per cent of the gain in output. However since the early sixties, increases in the number of cattle marketed have represented over 90 per cent of the increase in beef production.

Increased carcass weights have resulted from increased grain feeding of cattle and the increased proportion of beef breeds in the national herd. However, grain finishing of steers and to a considerable extent of heifers is now widespread and therefore further increases in carcass weights are likely to be less marked than in the past. In addition, consumers' tastes are increasingly favoring less finish than in the past.

In spite of the slower rate of increase in average carcass weights, beef production has not been significantly affected because an increased number of cattle have been slaughtered. These extra cattle slaughtered, however, have to some extent resulted from a reduction in the size of the national herd following a peak in the cattle cycle. The relationship between cow numbers, the output of cattle and calves and

the estimated number of additions to the herd, since 1949, is shown in Figure 1. The number of additions to the herd (born and surviving) has been estimated by adding (or subtracting, if there is a decline) the difference in the total cattle population between successive December surveys to the annual farm output of cattle and calves (Table 2). In years when the output of cattle and calves exceeds additions to the herd, a run-down or reduction in the total cattle population occurs. The incidence of periods when a run-down occurred is shown in Figure 1.

Since 1965, fewer calves have been entering the national herd than the number of cattle and calves being marketed, with the result that the breeding herd has been reduced. This is in marked contrast with the build-up in the breeding herd which occurred between 1958 and 1965. This process can, of course, only continue in the short run as subsequent output must be lower due to the fewer number of breeding animals.

From the above analysis, it is suggested that beef supplies in Canada in recent years have been sustained by two forces, neither of which are likely to operate to the same degree in the future. From the mid-fifties to the early sixties, increased feeding of cattle and the resulting heavier carcass weights provided a bonus in domestic production. Since then production has been maintained by increased slaughtering, partly at the expense of the breeding herd.

Future supplies will have to be based to an increasing extent on an expanded breeding herd of improved productivity. There is a limit to the extent to which current consumption can depend on borrowing from future supplies.

PROSPECTS FOR AN EXPANDED BREEDING HERD

With the likelihood of a slower rate of increase in carcass weights in the future, it follows that an increased number of breeding cows will be a prerequisite for expansion in the output of beef. However, recent Dominion Bureau of Statistics estimates do not indicate an upswing in cow numbers (Figure 1).

At June 1968, the total breeding cow population was 5.5 million, the lowest level since 1963. The number of both dairy cows and beef cows decreased compared with the previous years. The number of yearling heifers being kept for beef was also down at approximately 1 million head, the lowest level since 1963, indicating that there is no immediate prospect of a recovery in cow numbers.

The figures for December 1968 show a similar situation. Total cow numbers at 5.3 million were at their lowest December level since 1962 and were 134,000 less than in December 1967. The decrease of 88,000 in the beef cow population was particularly marked and represents a decline of 3 per cent. The number of yearling heifers being kept for beef purposes, 705,000, was 10 per cent less than in December 1967.

It is perhaps useful to consider why the current decrease in cow numbers appears to be persisting longer than was the case during previous troughs in the cycle, for example, in 1951 and 1958. It is suggested that land availability and producers' supply response to changing beef prices are factors influencing the rate of growth in the size of the breeding herd.

Land Restraint

The production of most agricultural commodities has become increasingly less dependent on land resources than in the past. Higher yielding crop varieties and increased capital expenditures on fertilizer, pesticides, etc. have reduced the relative importance of land in crop production. Similarly intensive housing and the substitution of cereals for forage in the production of most livestock and animal products has made land a less important input. However, this trend has been less pronounced in the beef industry, particularly in relation to the production of feeder cattle. Beef herds still require

considerable areas of relatively inexpensive land for the successful production of feeder cattle.

Higher land values and increased costs of land improvement may have limited the extension of land suitable for cow-calf operations. In addition, competition from alternative land uses e.g. forestry and recreation, could be presenting some barriers to the expansion of beef breeding herds in traditional ranching areas.

It has been estimated that to satisfy Canada's increased requirements for beef in 1980, increases of 11 million acres for forage production and 4 million acres for feed grain production will be required, after allowing for productivity gains (4). In spite of the vast land resources in Canada, the successful development of extra land and attempts to increase the productivity of improved land may be proving more difficult and expensive than was formerly thought.

Price Restraint

It is possible that the recent firm market conditions for beef could be a factor in the slow recovery in cow numbers since there is some evidence to suggest that the breeding herd expands more rapidly when beef prices are low. In Figure 2, average annual prices for good slaughter cows at Toronto and for good feeder steers at Calgary since 1949 are shown together with the corresponding changes in total cow numbers between successive December surveys. The Calgary price of feeder cattle is included because it reflects the demand for beef heifers in both United States and Canadian feed lots.

Comparison of the price levels and changes in cow numbers suggests that there is an inverse relationship between beef prices and growth of the national herd. In the past, expansion in cow numbers would appear to have been more rapid when prices were relatively low. Conversely when prices were high, declines have occurred or the rate of increase has slowed.

This relationship would appear to be consistent with the lack of flexibility in the supply response available to beef producers. An immediate response to higher beef prices can only be made by marketing cows and heifers which would normally have been retained in the breeding herd. For example, the firm cow prices for the last three years have probably been a contributing factor in the present decline in the breeding herd. Conversely, a fall in prices may induce producers to retain cows and heifers for breeding which otherwise would have been slaughtered. This has the effect of reducing supplies in the immediate period, but future supplies will be increased due to the resulting expansion of the breeding herd

CHANGES IN TOTAL COW NUMBERS IN RELATION TO BEEF PRICES, CANADA, 1949-68

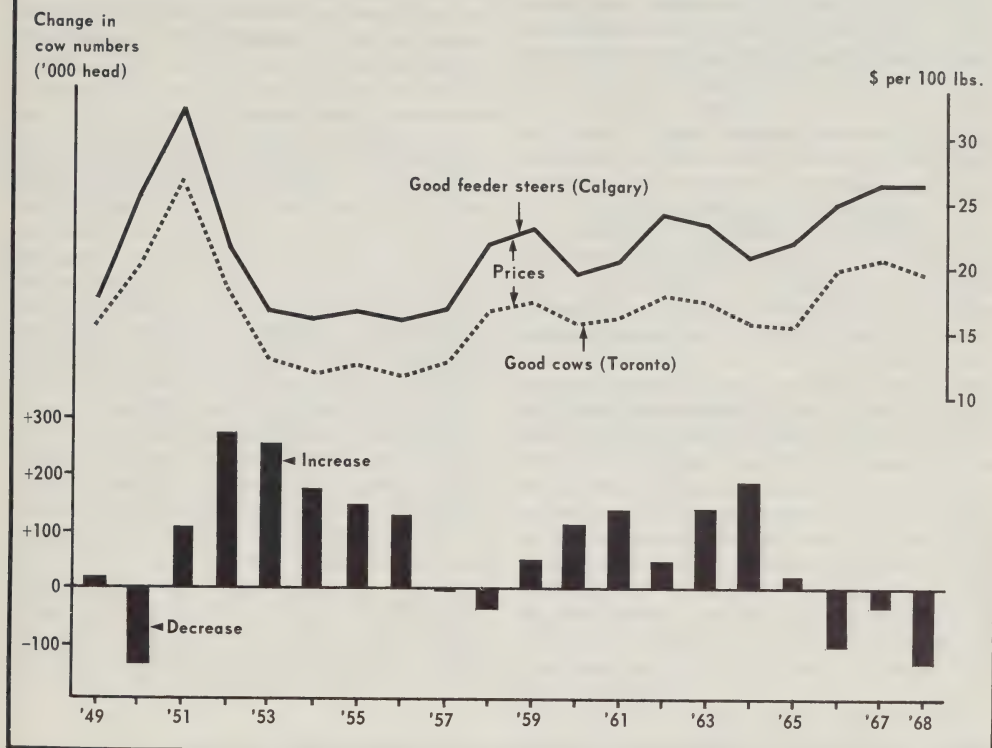


Figure 2

and the subsequent increase in the output of cattle and calves.

In this way, the paradoxical situation may arise in the short-run of favorable beef prices jeopardizing future expansion of the breeding herd. This occurs because beef heifers are marketed which would otherwise have entered the breeding herd. There is also a tendency for the decrease in the dairy herd to accelerate when beef prices are high. The loss of beef heifers is often noticeable in Western Canada as this type of animal is favored by U.S. buyers because the price spread between feeder steers and feeder heifers is often wider in Canada than in the U.S. On the other hand, low beef prices can stimulate an expansion in the breeding herd in the short-run because heifers may be retained on farms which under normal

market conditions would have been slaughtered. In addition, the culling of cows is often reduced when beef prices fall.

This perverse response by beef producers to price changes will to a large extent be a short term phenomenon but it may provide some explanation of the apparent sluggish recovery in the present swing of the cattle cycle. Although beef prices are determined in a North American market, there is no certainty that the supply response by producers to these prices in Canada and the U.S. will be identical. The establishment or expansion of beef herds involves long-term investment decisions. To the extent that investment behavior is different in the two countries, trends in cattle numbers in Canada could differ from the U.S. pattern.

PRODUCTIVITY OF THE BREEDING HERD

With prospects for the continuation of a strong demand for beef and the present lack of expansion in the breeding herd, it is of fundamental importance that the breeding cow population should be as productive as possible. It is therefore pertinent to examine some of the underlying relationships affecting the output of cattle to assess the extent to which the full potential of the breeding herd is being realized.

In the Economic Council's latest "Annual Review," concern was expressed about the productivity of Canadian agriculture, compared with that of the U.S. Although mainly concerned with crop yields and the output of milk and eggs, the "Review" also suggested that "in 1965 the yield in beef production was about 25 per cent lower in Canada than in the U.S." (5). This estimate was based on a comparison of cattle marketings per 100 cows in the two countries.

It is probable that the ratio of cattle marketings per 100 cows does not provide a complete comparison since the U.S. is a net importer of cattle and calves whereas Canada exports feeder cattle and calves. To the extent that Canada exports feeder calves to the U.S. which are subsequently marketed there as cattle, the U.S. ratio of cattle marketings per 100 cows is inflated. Conversely, the ratio for Canada is less than adequate as an indicator of productivity since calf exports are excluded. Furthermore, the number of cows on farms in Canada has been growing in at a faster rate than in the U.S. so relatively more

cattle have been retained on farms instead of being marketed. In the period from 1949 to 1965, the increase in the breeding herd in Canada was 41 per cent compared with only 29 per cent in the U.S.

Although not complete measures of the level of productivity in the beef sector, the following indicators are important in ensuring that the maximum quantity of beef is produced from a given size of breeding herd.

Number of Calves Born

Theoretically, it should be possible for each cow in the national breeding herd to produce a calf each year. In practice, however, this performance is not achieved for a number of reasons. Some cows appearing in the Census population do not calve, others will have an interval of more than 12 months between successive calvings while others will be culled or die.

The D.B.S. semi-annual survey of farms provides an estimate of the number of calves born on farms each year. When the number of calves born is compared with the number of cows on farms in June of the same year, it is seen that about 90 calves are born for each 100 cows (Table 3). This figure overstates the true calving rate for the national herd since some yearling heifers will calve during the year, but it does provide an indication of the trend in the productivity of the breeding herd.

The calving rate calculated on this basis has shown little change in recent years. A possible explanation for this apparent lack of improvement in the average calving rate for the national herd could be the in-

TABLE 3—CALVES BORN, MORTALITY AND PRODUCTIVITY OF BREEDING HERD, CANADA, 1951 TO 1967

Year	Calves Born	Calves Born per 100 cows ^a	Mortality	
			Calves ^b	Cattle ^c
	thousand head	number	per cent	
Average 1951-55.....	4,087	91.0	6.9	1.9
Average 1956-60.....	4,537	89.5	7.4	1.9
1961.....	4,702	88.3	7.2	1.9
1962.....	4,772	88.8	7.9	2.0
1963.....	4,875	89.4	7.6	2.0
1964.....	5,073	89.4	7.9	2.0
1965.....	5,311	91.1	7.9	2.1
1966.....	5,245	92.7	7.6	2.0
1967.....	5,120	90.8	8.2	2.1
1968.....	5,068	91.5	n.a.	n.a.

n.a. = not available.

^a Not a true calving rate.

^b Losses as percentage of calves born.

^c Losses as percentage of total cattle population (excluding calves) at December 1 of previous year.

Source: *Semi-annual Farm Survey*, Dominion Bureau of Statistics (unpublished).

creasing proportion of beef cows in the herd. Since the management of beef herds is more extensive than in the case of dairy cows, it is probable that beef herds have a lower calving rate than dairy herds. Thus the increasing proportion of beef cows in the total herd would tend to mask actual improvement in calving rates when these are calculated on a national basis.

The corresponding calving rate in the U.S. in recent years has been 86 calves per 100 cows (6). The better performance in Canada is possibly due to the lower proportion of beef cows in the breeding herd and to the relatively larger number of yearling heifers entering the herd.

Mortality

Of the calves born, a number are lost due to disease, injury, weather, etc. The D.B.S. survey indicates that losses among calves have ranged from 6.9 per cent to 8.2 per cent since 1951 (Table 3). Mortality varies from year to year mainly due to weather conditions with beef herds being particularly vulnerable to losses arising from late storms in the spring (7). The figures do not suggest any marked reductions in annual losses of calves. Losses also occur among cattle more than one year old and these have ranged from 1.8 per cent to 2.3 per cent of the total cattle population over one year.

Calf losses in the U.S. in recent years have been approximately 6 per cent of the number of calves born (6). The heavier losses in Canada may reflect more severe weather conditions than in most of the U.S.

Proportion of Farm Output Marketed as Calves

An important factor affecting the quantity of beef available from domestic sources is the proportion of animals marketed as calves as opposed to being retained and slaughtered as cattle. Since 1949, there has been a steady decline in the proportion of output slaughtered as calves. Whereas in the early fifties 37 per cent of total slaughterings consisted of calves, in 1967 it was only 29 per cent. This declining proportion reflects, firstly, the decrease in the number of dairy cows which results in fewer dairy calves, some of which are less suitable for beef production and have traditionally been slaughtered for veal. Secondly, an increasing number of these calves from dairy herds are now being retained and fed for slaughter at heavier weights and therefore make a greater contribution to beef supplies.

Over-all Productivity

An indication of the combined impact of improved management and production methods can be obtained by calculating the weight of beef and veal produced per cow over the years (Table 4). Since calving rates and mortality have shown little change, the major part of this improvement has resulted from the increased proportion of animals slaughtered as cattle rather than calves and also as a result of heavier carcass weights in general. In addition, the secular trend towards lower age at slaughter for cattle will also have contributed to increased over-all productivity.

SUMMARY AND IMPLICATIONS

Although beef production has been at a high level in recent years, the above discussion of developments in the supply sector of the industry suggests that this output has involved a run-down or reduction in cattle numbers and increases in average carcass weights. To achieve the projected increases in output, future expansion will have to be based to a greater extent on increased cattle numbers which in turn will require an expanded breeding herd of greater productivity.

Land availability and producer supply response to changes in beef prices are considered to be important factors influencing the rate of growth of the breeding herd. If the future rate of growth in cow numbers proves to be less rapid, it follows that productivity gains will have a more important role in expanding beef supplies to satisfy the projected growth in demand.

The prospects that feed grains will be in plentiful supply in the immediate future means that increases

TABLE 4—ESTIMATED FARM PRODUCTION OF BEEF AND VEAL PER COW, CANADA, 1951 TO 1967

Year	Total ^a	Per Cow ^b
	million pounds	pounds
Average 1951-55.....	1,129	250.9
Average 1956-60.....	1,472	290.4
1961.....	1,622	304.5
1962.....	1,577	293.4
1963.....	1,638	300.3
1964.....	1,750	308.3
1965.....	2,096	359.6
Average 1961-65.....	1,737	313.2
1966.....	2,032	358.9
1967.....	1,903	337.6

^a Calculated from *Livestock and Animal Products Statistics*, Cat. No. 23-203, Dominion Bureau of Statistics.

^b At June 1.

in cattle numbers assume greater importance. An adequate supply of feeder cattle and calves at reasonable prices can provide the means for marketing feed grains profitably as well as for meeting increases in consumer demand for high quality beef.

What are the implications for the beef industry of the prospects outlined above? It is probable that efforts by both individual producers and governments will be required to limit the impact of the various restraints to herd expansion which have been discussed. Briefly these can be considered as follows:

Land Availability

High land values and development costs will probably continue to limit the quantity of new land which will be used for cow-calf enterprises. More scope may exist for establishing beef herds where they complement other land uses. For example, there may be a potential for more beef herds in areas where recreation and forestry are the major land uses. In the same way, it may be possible to develop a cow-calf system which fits into the operations of what are now mainly grain farms. Technical developments in the use of straw balanced by urea-based supplements in cattle rations and inexpensive shelter may result in beef herds complementing mainly arable systems.

In the predominantly livestock farming areas of Eastern Canada, emphasis is needed on transferring resources employed in dairying to beef production. Farm amalgamation and rationalization programs could have a role to play in this respect.

In areas presently devoted to beef production, improved land productivity will be important. Improved range and pasture management, new conservation techniques and investment projects such as irrigation could be important means of increasing carrying capacities.

Beef Prices

Uncertainty about future beef prices is likely the prime factor causing the cyclical pattern in cow numbers. Producers are reluctant to forego a profit in the short run in the hope that future returns will be satisfactory. Similarly, low price situations are avoided in the hope that improved market conditions will return.

The aggregate result of the supply response of individual producers is the beef cycle which represents a less than optimum means of production. The development of improved market information, the operation of a futures market and the greater use of contractual arrangements are measures that can be employed to reduce uncertainty. If uncertainty about

future market conditions can be reduced, producers will be more prepared to make long-run plans for herd expansion. However, more knowledge is needed of the factors influencing investment decisions.

In some countries, more direct action has been employed in efforts to increase beef supplies. For example, in Ireland, there is a subsidy scheme under which a grant is paid to producers for each calved heifer introduced into herds over and above normal replacement requirements (8). As the grant is only paid on increases in herd size, there is an inducement to retain heifers and in addition the cost to the Government is not excessive. However, the timing of the introduction of such a scheme is critical so that it tends to eliminate rather than accentuate the beef cycle.

By restricting a scheme on these lines to farms which do not sell milk, the switching of resources from dairying to beef production can be encouraged. In this way, the program can help the rationalization of the dairy industry by enabling farmers to expand beef production while giving up milk production.

Productivity Gains

Increased productivity in relation to land resources is associated with improvements in calving rates and reduction in mortality. Increased supplies of fodder through improved range and pasture management will result in larger calf crops and fewer losses. However, there is a need for more information on other factors influencing calving rates and calf losses in beef herds. Continued efforts are needed to encourage the greater utilization of dairy calves for beef production.

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BEEF CATTLE PRODUCTION IN WEST CENTRAL MANITOBA (1)

L. M. Johnson

Beef production is big business. More than 300,000 Canadian farmers have cattle on their farms. Cows and heifers kept for beef numbered about 3 million head in 1966 (2). In 1967 net marketing was more than 3.6 million head with sales valued at about \$850 million (3). At the same time beef and veal consumption in Canada averaged 88 pounds per capita (4). The figure reflects an average annual increase in consumption of more than one pound per person during the last 30 years.

Several economists have made projections concerning future increases in livestock production. These have been based on projected needs, on estimates of population growth, and on the assumption that continuous prosperity will result in more meat consumption per capita. Van Vliet estimates that total beef production in Canada is expected to increase by 60 per cent by 1980 and by 180 per cent by the year 2000 compared with 1965 (5). In comparison with 1967, population in 1980 will be about 28 per cent higher. Compared with the base period 1964-66, per capita consumption of beef will increase by 23 per cent and total annual consumption will increase from 1,592 million pounds to 2,605 million pounds (6).

At the provincial level the *Report of the Committee on Manitoba's Economic Future* (7), covering the period 1962-75, expects a similar growth in demand for livestock products and estimates that Manitoba could double its beef output by 1975. Census statistics (8) reveal that between 1951 and 1966 total cattle numbers in Manitoba increased from 671,183 to 1,151,179, an increase of 72 per cent. Only 12 per cent of the total increase, however, occurred between 1961 and 1966.

In 1967, about 40 per cent of all farm cash receipts in Manitoba came from livestock (9). The livestock industry is, therefore, important to Manitoba farmers. Periods of ready markets for grain, of course, tend to discourage livestock production. Grain markets for the future, however, are not assured whereas market demand for beef is expanding.

With the above basic considerations in mind, it becomes imperative to study some of the factors involved in beef production if expected requirements are to be met. If farmers are to make the most profitable use of their resources, they must evaluate in a systematic way the profits resulting from different production alternatives. With rapidly changing technology and fluctuations in economic conditions, this evaluation process must be continuous. Farmers

who fail to adjust to new circumstances find it increasingly difficult to achieve profitable farm operations.

The Problem

Despite the importance of livestock as a source of farm cash receipts many beef cattle operations are poorly managed and provide relatively low returns. Economic success depends on the overall organization of the farm business as well as the efficient operation of each enterprise. Specifically, there are perhaps five main factors responsible for small returns to a beef enterprise:

(1) Low weaning percentage and low weaning weight.

(2) Feeding programs. Many farmers overfeed stock or rations are not balanced to meet animal requirements; hence costs increase.

(3) Low pasture carrying capacity. This may mean that the pasture land is low in quality or that a considerable amount of waste land cannot be used in its present form.

(4) Relatively poor breeding stock.

(5) Many farmers lack operating capital, are unable to obtain credit or are unwilling to borrow capital.

Some of these problems are functions of management. Management factors and costs of production have frequently been cited for their importance in determining profits. Most livestock men are aware of their significance but find it difficult to improve on them. To the extent that this is so, there exists an opportunity for increasing income through improved management practices.

Study Objective

The purpose of this paper is to describe and analyze the present farm organization and operation, available resources, resource use and the associated income and expense that presently prevail on farms in West Central Manitoba. Three systems of beef herd management are examined to determine which system is most profitable. Some of the results in this article will be used in a subsequent study on farm beef cattle operations.

Methodology

Forty farmers in West Central Manitoba were interviewed on their beef cattle operations covering

the 1964-66 period. These farm operators had previously participated in or were present members of the Manitoba Farm Business Group program (10). At the time of visitation farm accounts were checked for accuracy and information on physical inputs was obtained. The data presented herein do not fit any particular sample farm because each farm is unique and differs in certain respects from other farms.

For purposes of analysis farms were classified into three livestock management systems: cow-calf, feeder and stocker.

The cow-calf system is defined as one where most of the calves are sold in October or November as feeder calves. These calves are born in February or March and nursed until they are weaned and sold. They are then finished on other farms or feedlots. This operation is most suitable to farms that have large amounts of roughages and pasture and limited quantities of grain.

The feeder system is defined as one in which the calves are sold as finished animals. Most of the calves are farm produced but some may also be purchased. Management of the cow herd is usually the same as it is for the cow-calf system. After weaning, calves are drylot fed until they are ready for sale as finished beef. Some farmers feed the calves a growing ration through the winter and then provide a light grain feed on pasture until midsummer. Thereafter the cattle are given a full grain feed before being offered for sale in the fall of the year. More grain and a smaller amount of forage is converted to saleable beef with the feeder system than with the cow-calf system.

The stocker system is defined as one in which the calves are sold as long yearlings. Usually the cow herd is managed in the same manner as it is in the cow-calf system. After the calves are weaned, the farmer feeds the animal through the winter for growth and development rather than for fattening. In the spring the stockers are placed on pasture until the following fall when they are sold. These are then

probably finished in a feedlot. To a large extent a good stocker program depends on an ample supply of inexpensive roughage for the winter and low cost pasture for the summer.

Every attempt was made to select farms which followed one livestock management system, i.e., cow-calf, feeder or stocker. All farm operators, however, did not rigidly adhere to one system. Some calves might be sold at weaning time as feeders and others might be winterfed and sold as finished beef in the spring. Each farm in this study was placed in the group closest to the particular system followed.

Study Area

The study was made in the Newdale-Birtle-Russell area in West Central Manitoba. The clay loam soils are relatively fertile Northern Black Earths developed on glacial till (11). The undulating topography is characterized by numerous small potholes and undrained depressions. Grain and forage crops grown are those common to the Prairies. In the study area the high percentage of unimproved land, good water supply and abundance of feed grain favors the operation of beef cattle enterprises.

Census Divisions 11 and 13 are representative of the area selected for study. Table 1 shows the number of farms in these divisions classified by size-group. In 1966 the average size of farm was 578 acres of which 63 per cent was improved. Generally, the farms analyzed in this study were larger than average. Most sample farms fall in the ranges over 560 acres and in most instances represent the top 40 per cent of all census farms.

Cattle numbers increased by about 10 per cent between 1961 and 1966 in Census Divisions 11 and 13. Since the number of farms with cattle declined from 3,088 to 2,594 during this period, the number of head per farm correspondingly increased from 32 to 42.

FARM ORGANIZATION

Land Use

The study farms with cow-calf systems averaged 1,504 acres in size, feeder systems, 1,012 acres, and stocker systems, 708 acres (Table 2). As the average census farm size in this area was 578 acres in 1966, the study farms were considerably above average in size.

Cow-calf farms averaged 756 acres of cropland or 50 per cent of the total farm area. Feeder cattle farms averaged 726 acres of cropland or 72 per cent of the total farm area and stocker farms averaged 479 acres of cropland or 67 per cent of the total farm area. Tame hay and pasture occupied 22 per cent of the

TABLE 1—CENSUS FARMS CLASSIFIED BY SIZE OF FARM, CENSUS DIVISIONS 11 AND 13, MANITOBA, 1966

Size range	Number	Per cent
Under 399 acres.....	1,248	37
400-449 acres.....	710	21
560-759 acres.....	635	19
760-1,119 acres.....	510	15
1,120-1,599 acres.....	200	6
Over 1,599 acres.....	74	2
Total.....	3,377	100

Source: Census of Canada, Agriculture, Manitoba, 1966.

TABLE 2—AVERAGE LAND USE PER FARM BY SYSTEM OF BEEF HERD MANAGEMENT, 40 FARMS, WEST CENTRAL MANITOBA

Land use	System		
	Cow-calf	Feeder	Stocker
Number of farms.....	13	14	13
	acres per farm		
Cropland:			
Wheat.....	272	214	147
Oats.....	37	75	43
Barley.....	33	85	57
Flax.....	21	41	—
Tame hay.....	114	44	54
Other.....	89	71	35
Improved pasture.....	50	33	28
Summerfallow.....	140	163	115
Total improved.....	756	726	479
Unimproved and farmstead.....	748	286	229
Total farm area.....	1,504	1,012	708

* Includes rapeseed, mixed grain, breaking.

cropland for cow-calf systems with 17 and 11 being the respective percentages for the stocker and feeder systems of operation. This indicates the somewhat higher pasture and forage requirements of the cow-calf and stocker systems. The percentage of cropland in cereal crops and small grains was 10 per cent higher for the feeder system than for the other two systems.

Machinery and Building Investment

Investment in machinery and equipment amounted to \$22,333, \$18,490 and \$10,193 for the cow-calf, feeder and stocker operations respectively or \$29.54, \$25.47 and \$21.28 per cropland acre. Investment in barns, fences, wells and dugouts amounted to \$5,564, \$3,816 and \$2,141 for the cow-calf, feeder and stocker operations in that order or \$8.59, \$6.55 and \$4.72 on a per animal unit basis.

Value of Production

Gross value of production by system of herd management is shown in Table 3. Miscellaneous income includes rentals, patronage payments, off-farm work, etc. Since patronage payments are included in miscellaneous, the value of crop production would be somewhat higher than the amount shown. The feeder cattle system of management purchased considerably more grain, feed and livestock than did the other two systems of management. Gross income per cropland acre amounted to \$26.29, \$30.86 and \$27.70 for the cow-calf, feeder and stocker operations in the order given.

Expenses

Table 4 shows a summary of farm operating expenses by system of management. Livestock expenses

TABLE 3—GROSS VALUE OF PRODUCTION PER FARM BY SYSTEM OF BEEF HERD MANAGEMENT, 40 FARMS WEST CENTRAL MANITOBA

Item	System		
	Cow-calf	Feeder	Stocker
Number of farms.....	13	14	13
	dollars per farm		
Crop.....	9,614	11,070	7,163
Livestock.....	4,811	8,677	3,842
Milk, cream, eggs.....	154	114	122
Miscellaneous.....	3,693	2,903	1,887
Total operating receipts.....	18,272	22,764	13,014
Change in livestock.....	15	343	349
Change in grain.....	2,112	941	493
Home used.....	112	261	247
Grain and feed purchased.....	385	705	388
Livestock purchased.....	253	1,196	445
Gross value.....	19,873	22,408	13,270

TABLE 4— SUMMARY OF AVERAGE EXPENSES BY SYSTEM OF BEEF HERD MANAGEMENT, 40 FARMS, WEST CENTRAL MANITOBA

Item	System		
	Cow-calf	Feeder	Stocker
Number of farms.....	13	14	13
		dollars per farm	
Crop.....	1,607	1,858	1,009
Livestock.....	278	529	208
Machinery and equipment.....	2,513	2,200	1,619
Buildings.....	431	381	99
Farm overhead.....	1,160	1,160	723
Other.....	399	1,342	828
Hired labor.....	619	433	368
Sub-total.....	7,007	7,903	4,854
Depreciation.....	3,994	3,229	1,554
Total farm expenses ^a	11,001	11,132	6,408

^a Does not include interest on investment.

include supplements, minerals, veterinary and medicine and other direct outlays. Grain, roughage or livestock purchased are not included since these were deducted from gross profit in Table 3. Farm overhead includes land taxes, fire insurance, hydro, telephone and miscellaneous items such as newspapers and bank charges. Depreciation on farm buildings, machinery and equipment was a significant cost on all farms. Although depreciation is not an out-of-pocket expense in any given year, it nevertheless represents a cost since it must be paid in the long run.

The gross expense ratio is an efficiency measure which indicates the portion of gross income taken up by total costs. The respective ratios for the cow-calf, feeder and stocker systems of operation were 55 per cent, 50 per cent and 48 per cent.

Return to Operator

Return to operator and family is a measure of the profitability of the farm operation. In this study it was the return for capital, labor and management. Returns per farm amounted to \$8,872, \$11,256 and \$6,862 on cow-calf, feeder and stocker systems respectively or \$11.74, \$15.50 and \$14.33 per cropland acre.

Net Worth

Operating net worth is a measure of financial status at the end of the year (Table 5). It is the farm and personal assets minus the farm and personal liabilities. The operating net worth as calculated, will differ from "sell out" net worth by the amount that the estimated value of land and buildings differs from actual market value.

TABLE 5—AVERAGE OPERATING NET WORTH STATEMENT BY SYSTEM OF BEEF HERD MANAGEMENT, 40 FARMS, WEST CENTRAL MANITOBA

Item	System		
	Cow-calf	Feeder	Stocker
Number of farms.....	13	14	13
		dollars per farm	
Real estate.....	50,849	47,537	27,906
Machinery and equipment.....	22,334	18,477	10,191
Livestock.....	12,060	11,924	8,838
Grain, feed, supplies.....	11,216	10,329	5,682
Other.....	319	305	541
Total farm assets.....	96,778	88,572	53,158
Farm liabilities.....	19,313	13,729	6,005
Personal assets.....	15,960	10,074	6,051
Total net worth ^a	93,425	84,917	53,204

^a Value at beginning of the year.

TABLE 6—AVERAGE INVENTORY OF LIVESTOCK BY SYSTEM OF BEEF HERD MANAGEMENT, 40 FARMS, WEST CENTRAL MANITOBA

Type	System					
	Cow-calf		Feeder		Stocker	
	Number	Value	Number	Value	Number	Value
		dollars		dollars		dollars
Number of farms.....	13		14		13	
Cows.....	52.4	8,612	34.0	5,520	30.0	5,156
Heifers (replacement).....	6.4	851	5.7	824	6.7	865
Feeder calves.....	1.2	216	45.7	4,550	4.1	471
Stocker calves.....	—	—	.1	14	22.9	2,050
Calves.....	14.8	1,440	—	—	—	—
Bulls.....	1.6	761	1.4	479	.8	291
Total cattle.....	76.4	11,880	86.9	11,387	64.5	8,833

* Numbers and values are the average of the beginning and end of year inventories.

The value of real estate averaged \$33.81, \$46.97 and \$38.92 per total acre and \$67.26, \$65.48 and \$58.26 per cropland acre for the cow-calf, feeder and stocker systems of operation in that order. Operating net worth averaged \$123.58, \$116.97 and \$111.07 respectively per cropland acre for the cow-calf, feeder and stocker operations.

Capital Turnover

Capital turnover is an efficiency measure which indicates the ratio of total farm investment to gross profit and is expressed as a percentage. Capital turnover is a measurement of productivity relative to investment; hence a high turnover ratio is associated with a profitable farm operation. The capital turnover was 21 per cent on the cow-calf systems and 25 per cent on both feeder and stocker systems. This shows that these systems turned over their total farm assets every four to five years on the average.

THE BEEF CATTLE ENTERPRISE

Beef was the major livestock enterprise on all farms. Other livestock consisted of hogs, dairy cattle, and horses but these were all minor in importance.

Livestock Numbers

Cow-calf system farms averaged 52.4 cows; feeder systems, 34.0 cows; and stocker systems, 30.0 cows (Table 6). Generally, there were only breeding animals on hand for the cow-calf systems when the inventory was taken at the beginning and the end of the year. As the calves had not been dropped at these times, only late or early calves were found on the farms. On the other systems, calves were being held over the winter and were part of the inventory. Most farms had some replacement heifers and averaged six head for all farms. The replacement rate ranged from a low of 12 per cent to a high of 20 per cent.

TABLE 7—AVERAGE CURRENT OPERATING COSTS FOR THE CATTLE ENTERPRISE BY SYSTEM OF BEEF HERD MANAGEMENT, 40 FARMS, WEST CENTRAL MANITOBA

Item	System		
	Cow-calf	Feeder	Stocker
Number of farms.....	13	14	13
		dollars per farm	
Grain.....	647	1,890	796
Roughages.....	2,094	1,466	1,277
Other.....	62	5	61
Minerals and supplements.....	80	153	49
Sub-total feed.....	2,883	3,514	2,183
Veterinary and medicine.....	73	101	54
Other current costs.....	102	33	61
Pasture costs.....	619	420	386
Total operating costs.....	3,677	4,068	2,684

TABLE 8—BUILDINGS, MACHINERY AND OTHER COSTS FOR THE CATTLE ENTERPRISE BY SYSTEM OF BEEF HERD MANAGEMENT, 40 FARMS, WEST CENTRAL MANITOBA

Item	System		
	Cow-calf	Feeder	Stocker
Number of farms.....	13	14	13
		dollars per farm	
Buildings.....	68	68	19
Fences, wells, dugouts.....	104	54	51
Machinery and equipment ^a	257	272	186
Fire insurance dues.....	85	33	19
Hydro and telephone.....	79	77	69
Depreciation			
Building.....	184	116	94
Machinery and equipment.....	196	210	124
Total costs.....	973	830	562

^a Includes livestock, share of car, truck, tractor and other equipment.

On the cow-calf systems the value of the cows averaged \$164 and bulls \$476; on the feeder systems cows averaged \$162 and bulls \$342; and on the stocker systems cows averaged \$172 and bulls \$364. These values were estimates made by the farmers at the time the inventories were taken and were based on their knowledge of market prices.

Feed and Other Current Costs

Table 7 shows the feed, pasture and other current costs per farm by system of beef herd management. Including replacement heifers the average total cost for these items on a per cow basis amounted to \$62.53, \$102.47 and \$73.13 for the respective cow-calf, feeder and stocker systems of operation. The high operating costs per cow for the feeder operations resulted from the relatively large expense for feed grain.

Building, Machinery and Other Costs

Building, machinery and other costs to the cattle operation are presented in Table 8. Many buildings and much of the machinery is shared with other farm enterprises. The portion of the total costs of these items to be allocated to the livestock enterprise was estimated by the farmer. On a per cow basis these costs averaged \$16.55, \$20.91 and \$15.31 for the cow-calf, feeder and stocker system of operation in that order.

Gross Returns to Cattle Operations

Returns from items sold were valued at the actual prices received (Table 9). Animals slaughtered and milk or cream consumed by the family were priced at market value. Manure nutrients were not evalu-

TABLE 9—GROSS RETURNS PER FARM TO THE CATTLE ENTERPRISE BY SYSTEM OF BEEF HERD MANAGEMENT, 40 FARMS, WEST CENTRAL MANITOBA

Type of livestock	System					
	Cow-calf		Feeder		Stocker	
	Number	Value	Number	Value	Number	Value
		dollars		dollars		dollars
Number of farms.....	13		14		13	
Bulls.....	.5	132	.8	255	.3	73
Cows.....	6.2	654	3.9	634	5.4	722
Heifers.....	.5	40	4.3	682	1.2	143
Feeders.....	.3	45	25.7	5,146	—	—
Stockers.....	—	—	—	—	16.8	2,408
Calves.....	42.4	3,643	2.2	213	3.3	260
Sub-total livestock sales.....	49.9	4,514	36.9	6,930	27.0	3,606
Cream and milk sales.....		134		109		113
Home consumed.....		136		155		159
Inventory change.....		41		332		368
Value of livestock purchased.....		152		1,058		403
Gross returns to livestock.....		4,673		6,468		3,843

ated in this study. The cost of purchased livestock was deducted from gross sales to arrive at gross returns to the livestock enterprise. On a per cow basis livestock returns, adjusted for change in inventory, averaged \$79.47, \$162.92 and \$104.72 for the cow-calf, feeder and stocker systems of management respectively. Only the feeder systems had any significant outlay for livestock purchases, an average of \$1,058 per farm.

Cost and Returns per Beef Cow

Production costs can be divided into variable or out-of-pocket and fixed or overhead costs. Farmers are usually more aware of variable costs because they must be paid during the production cycle. Market prices paid for these inputs were used in this

study. These are presented together with returns on a per cow basis by system of management in Table 10.

Fixed costs are costs for pasture together with interest and depreciation on buildings, machinery, and equipment. The fact that some operators did not meet total costs of production does not mean they would be forced out of production. Production could and would continue as long as the fixed assets are available for use or are replaceable with assets of satisfactory utility at a lower cost. As an example, some farmers used building space which they could not afford to replace with structures of similar design at current prices. It might also be possible for operators to handle the beef enterprise with less shelter than was actually used or to construct satisfactory shelter at a lower cost.

TABLE 10—COSTS AND RETURNS PER BEEF COW BY SYSTEM OF MANAGEMENT, 40 FARMS, WEST CENTRAL MANITOBA

Item	System		
	Cow-calf	Feeder	Stocker
Number of farms.....	13	14	13
	dollars per cow		
Costs (variable)			
Grain, supplements.....	11.00	47.61	21.69
Hay, silage, straw, etc.....	38.03	40.91	37.79
Total feed.....	49.03	88.52	59.48
Interest ^a	12.02	17.51	14.01
Insurance, dues, etc.....	1.44	0.83	0.52
Veterinary, medicine.....	1.24	2.54	1.47
Hydro, telephone.....	1.34	1.94	1.88
Machinery and equipment.....	4.37	6.85	5.07
Buildings, fences, wells, etc.....	2.93	3.07	1.91
Other costs.....	1.73	0.83	1.66
Total cash costs.....	74.10	122.09	86.00
Costs (fixed)			
Pasture.....	10.53	10.58	10.52
Buildings.....	7.87	7.03	5.72
Machinery and equipment.....	4.76	7.55	4.77
Total fixed costs ^b	23.16	25.16	21.01
Total all costs.....	97.26	147.25	107.01
Returns			
Beef sales.....	76.77	174.55	98.26
Cream and milk sales.....	2.28	2.75	3.08
Home consumed.....	2.31	3.90	4.33
Livestock purchased.....	2.59	26.64	10.98
Total return.....	78.77	154.57	94.69
Inventory change.....	+ 0.70	+ 8.36	+10.03
Returns over all costs ^c	-17.79	+15.68	- 2.29
Returns over cash costs.....	+ 5.37	+40.84	+18.72

^a Interest on livestock inventory and farm stored hay and grain.

^b Interest and depreciation on buildings and machinery are included as part of fixed costs.

^c Adjusted for inventory change.

The average farmer using the cow-calf or stocker system of management failed to meet all costs. On the average the feeder operator was able to meet all expenses and provide some return to labor. All farm operators, regardless of management system, however, did receive a net return over cash costs on the average.

Considerable variation in production costs was found among the three systems. The feeder system used more resource inputs per cow but received the highest gross income. The cow-calf system had both lower costs and lower cash returns, but also received a smaller return over cash costs per cow than the feeder or stocker systems. Pasture costs on a per cow basis were about the same for all systems of management. Feed inputs used in production were, however, quite different. Grain and supplements, for instance, made up 22, 54 and 36 per cent of the costs for the ration in the cow-calf, feeder and stocker systems of operation respectively whereas roughage amounted to 78, 46 and 64 per cent.

Returns over cash costs for the entire beef enterprise may be more meaningful to farm operators than the costs per cow or total costs of production.

When the operator knows that cash costs are covered he is in a more favorable position to decide whether livestock operations should be continued. In the short run the beef enterprise may be economically desirable on the farm even though the total costs of labor, pasture and buildings are not fully covered. If the costs for these items are partially covered the farm operator realizes some return at least for these inputs. In the long run all costs of production, however, must be taken into account.

Based on the costs and returns in this study, 48 per cent of the farmers met all production costs including pasture and buildings and they also received some returns to labor. Eighty-two per cent of the farm operators were able to meet their variable costs of production and then had some cash available for fixed costs. All farms managed to cover the cost of roughages, feed grains and supplements.

Labor Use

Table 11 shows the total hours of labor and hours per animal unit expended on the cattle enterprise according to system of management. Considerably

TABLE 11— HOURS OF LABOR USED FOR THE CATTLE ENTERPRISE BY MONTH AND SEASON ACCORDING TO SYSTEM OF BEEF HERD MANAGEMENT, 40 FARMS, WEST CENTRAL MANITOBA

Item	System					
	Cow-calf		Feeder		Stocker	
	Total hours	Hours Per A.U.	Total hours	Hours Per A.U.	Total hours	Hours Per A.U.
Number of farms.....	13		14		13	
Number of animal units.....	64.8		58.3		45.4	
November.....	121.8	1.9	84.6	1.4	119.0	2.6
December.....	130.8	2.0	88.4	1.5	126.4	2.8
January.....	135.7	2.1	100.0	1.7	136.0	3.0
February.....	133.4	2.1	96.6	1.6	134.1	2.9
March.....	143.5	2.2	101.5	1.7	144.9	3.2
April.....	120.1	1.9	105.9	1.8	131.0	2.8
Total winter.....	785.3	12.2	577.0	9.7	791.4	17.3
May.....	74.0	1.1	51.6	.9	71.2	1.6
June.....	34.1	.5	36.8	.6	54.2	1.2
Total spring.....	108.1	1.6	88.4	1.5	125.4	2.8
July.....	45.6	.7	37.1	.6	35.2	.8
August.....	47.3	.7	30.3	.5	30.6	.7
Total summer.....	92.9	1.4	67.4	1.1	65.8	1.5
September.....	45.8	.7	33.7	.6	37.9	.8
October.....	61.5	1.0	43.9	.8	58.1	1.3
Total fall.....	107.3	1.7	77.6	1.4	96.0	2.1
Total labor use*.....	1,093.6	16.9	810.4	13.7	1,078.6	23.7

Labor use as estimated by the farm operator.

less total labor and less labor per animal unit was used in operating the feeder system than in the other two systems of management. The difference in hours of labor used between the feeder and stocker systems may be due to the fact that the stockers were kept on farms over a longer period of time. The feeder systems also averaged 58.3 animal units compared with 45.4 animal units for the stocker system and may have resulted in economies of scale which could have reduced labor requirements per animal unit. The greater efficiency in labor use of the feeder systems compared with the cow-calf systems could be due to the fact that cow-calf systems at calving time require an additional amount of work on account of the greater average number of cows.

If all returns above cash costs were credited to labor, the cow-calf, feeder and stocker farm operators would have received \$0.29, \$2.00 and \$0.64 per hour respectively. The feeder type of management system was, therefore, economically more advantageous than the cow-calf or stocker systems of management. The low labor returns in the latter systems can be attributed both to lower returns over cash costs and to higher labor requirements.

SUMMARY AND CONCLUSIONS

This paper was based on a sample survey of 40 farms in West Central Manitoba that had beef cattle enterprises. The farms in this study were generally above average in size and net worth compared with census farms in this area. Costs, returns and resource requirements were calculated for cow-calf, feeder and stocker systems of beef cattle operations. Income produced per cow was significantly different for each of these systems. Using actual prices received, gross returns per cow including inventory change were \$79, \$163 and \$105 for the cow-calf, feeder and stocker systems of management in that order.

Excepting the feeder system the value of production per cow was not high enough to pay market prices for all the resources used by the beef enterprises. On the average the cow-calf system failed to pay all costs by about \$18 per cow and the stocker system failed by about \$2 per cow. Although gross income was not sufficient to cover all costs, it was more than enough to cover the variable costs. This indicated that beef cattle operations did provide some return to the fixed costs. With the cost structure and organization that these farm operators have at present, however, the cow-calf and stocker systems are unprofitable on the average if it were necessary to pay market prices for all inputs.

Most of the feed requirements for beef cattle were farm produced. Native hay together with some seed-

ed forage, grain and supplements made up the ration. In general the cattle were fed during the winter, a period of about six months.

Labor used per cow varied by system of management. The greatest economies were realized with the feeder system which averaged about 14 hours of labor per cow. The cow-calf system averaged about 17 hours of labor per cow and the stocker system about 24 hours.

Some form of shelter for the winter was provided on all farms. Pole sheds and corrals were often used in the feeder or stocker operations and enclosed barns were usually provided for the cows.

For all study farms the average investment in buildings, fences, wells and dugouts was \$85 per cow, in livestock \$237 and in general and miscellaneous livestock equipment \$14 for a total investment of \$336 per cow. However, this did not include investment in haying equipment or the livestock share of tractors, trucks or cars.

The ability to utilize resources efficiently was important in handling the beef cattle enterprise. Profits were realized by farm operators who achieved a high production of beef per cow while keeping down feed, labor and overhead costs. On the average only the feeder system farms earned a profit above all expenses. The fact that the cow-calf and stocker systems of management were unable to meet all production costs under the present farm organization and circumstances suggests there are unanswered questions concerning the effect of superior levels of management on resource use and returns to the beef cattle enterprise. The combination of enterprises that will return the highest income to typical beef-grain farms will be examined in a later study by the use of linear programming. Some information obtained in the present paper along with experimental results will be the basic data used in the subsequent study.

NOTES AND REFERENCES

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- (7) *Manitoba 1962-1975*, Report of the Committee on Manitoba's Economic Future to the Government of Manitoba (1963).
- (8) *Census of Agriculture, Manitoba*, 1966, Dominion Bureau of Statistics.
- (9) *Farm Cash Receipts*, Fourth Quarter and Annual Totals, Cat. No. 21-001, 1967, p. 6, Dominion Bureau of Statistics.
- (10) The Manitoba Farm Business Group Program is a three year project in which farmers keep records of their whole farm operation as well as additional feed and labor records which enable them to analyze each enterprise on their farms. The program is continuous in nature in that a new group is set up when one graduates. In addition to record keeping, regular meetings are held to discuss such topics as farm management, agricultural engineering, soils, crops and livestock with instructors from the respective branches of the Manitoba Department of Agriculture.
- (11) W. A. Ehrlich, L. E. Pratt, and E. A. Poyser, *Report of Reconnaissance Soil Survey of Rosburn and Virden Map Sheet Areas*, Manitoba Soil Survey, Canada Department of Agriculture, Provincial Department of Agriculture and Soils Department, The University of Manitoba, April, 1956.

BEEF PRODUCTION ON PART-TIME RANCHES ON THE INTERIOR PLATEAU OF BRITISH COLUMBIA, 1966

N. D. Turnbull

A study of 24 part-time ranches in the interior of British Columbia was undertaken in 1966 as part of an overall study of the beef industry in the province (1). The purpose of studying part-time ranches was to obtain information on the ranch organization, and the capital investment, income and expenses associated with ranch operations. For the purposes of this study a part-time ranch was defined as one with less than 75 animal units.

PHYSICAL CHARACTERISTICS OF THE STUDY AREA

The study area was in the Shuswap-Chilcotin and the Okanagan-Similkameen regions. The well-known ranching centres of Merritt, Kamloops, Clinton and Williams Lake are situated in the area (2).

The study area is a large plateau bordered on the east and west by mountains. This plateau reaches 5,000 feet above sea level in the south but gradually decreases in elevation and broadens as it extends

northward. The topography is mostly undulating to rolling and broken by river systems that occupy deep, narrow valleys. Near the eastern edge, the plateau is broken by the Okanagan Trench, a wide, deep valley.

Rough topography and a short growing season make most of the plateau unfit for cultivation. The small area of land used for crops forms a ribbon-like pattern in the larger valleys. Open grass-land and a mixed grass and forest cover are typical of the main valleys and lower slopes. The ridges are forested but the tree cover is generally less dense than in the mountains (3).

STUDY RESULTS

Characteristics of the Operators

The operators of these part-time ranches ranged in age from 21 to 65 years, and had an average age of 46 years. They had operated their ranches for an average of 17 years; all but 6 had been on their ranches 5 years or more.

TABLE 1—AVERAGE LAND USE ON 24 PART-TIME RANCHES ON THE INTERIOR PLATEAU OF BRITISH COLUMBIA, 1966-67

	Per Ranch	Per Animal Unit
	acres	
Improved land		
Grain for hay	7	0.1
Alfalfa	7	0.1
Grass and grass-legume mixtures	59	1.2
Total hay and silage crops	73	1.4
Pasture	11	0.2
Grain	7	0.1
Other crops	3	—
Total improved land	94	1.7
Unimproved land		
Grass and meadow	169	3.2
Bush	565	10.6
Waste	7	0.1
Total unimproved land	741	13.9
Total land area	835	15.6
Range in size	acres	
Improved land	30 to 200	
Total land	153 to 4,968	

Land Use

The size of these 24 part-time ranches ranged from 153 acres to 4,968 acres and averaged 835 acres (Table 1). Land improved for crop production averaged 94 acres and ranged from 30 acres to 200 acres. An average of 20 acres of improved land was irrigated. In 1966, 66 acres of land was used for hays, 14 acres for grain, 11 acres for pasture, and 3 acres for summerfallow and other uses. The average ranch had 169 acres of unimproved grass and meadow. Improved land averaged 1.7 acres per animal unit (4) and grass and meadow averaged 3.2 acres.

Crop Yields

Hay yields averaged 1.87 tons per acre on irrigated land and 1.46 tons per acre on non-irrigated land (Table 2). Grain yielded an average of 0.6 tons per acre.

Livestock

On April 1, 1966, the average beef herd consisted of 36 cows and two-year-old heifers, 2 two-year-old steers, 17 yearling steers and heifers and 2 bulls. During the year 31 calves were born, an average calf crop of 86 per cent (Table 3). Thirty-four animals were sold during the year, of which 47 per cent were calves and 29 per cent yearling steers and heifers. The average herd increased by 11 animals, 8 steers and 3 cows and heifers, during the year.

Labor

Nearly all the labor on these part-time ranches was supplied by the operator and his family. An average of 1.1 man-equivalents of labor was used per ranch of which amount 0.1 man-equivalent was hired (5). One man cared for an average of 49 animal units of livestock.

TABLE 2—AVERAGE YIELDS PER ACRE FOR IRRIGATED AND NON-IRRIGATED LAND ON 24 PART-TIME RANCHES ON THE INTERIOR PLATEAU OF BRITISH COLUMBIA, 1966-67

	Irrigated	Non-irrigated
		tons
Grain-hay	1.38	1.50
Alfalfa	2.13	1.50
Grasses and mixed	1.73	1.46
Average all hay	1.87	1.46
Average yield of all hay		1.58 tons per acre
Average yield of wheat . . . . .		.55 tons per acre
Average yield of oats . . . . .		.66 tons per acre
Average yield of barley . . . . .		.82 tons per acre
Average yield of all grain . . . . .		.6 tons per acre

TABLE 3—AVERAGE NUMBER OF CATTLE AS OF APRIL 1, 1966, NUMBER OF CALVES BORN AND PERCENTAGE DISTRIBUTION OF CATTLE SOLD ON 24 PART-TIME RANCHES ON THE INTERIOR PLATEAU OF BRITISH COLUMBIA, 1966-67

	On Hand April 1, 1966	Sold During Year April 1, 1966 to March 31, 1967
Total number of head per ranch including calves	88	34
	number	per cent of sales
Breeding stock: cows and 2-year-old heifers	36	21
Steers: 2 years or older	2	3
Yearling steers and heifers	17	29
Bulls	2	a
Calves	31	47
Cows per bull	25	
Per cent calf crop		86.1

a Less than 0.5

TABLE 4—AVERAGE CAPITAL INVESTMENT ON 24 PART-TIME RANCHES ON THE INTERIOR PLATEAU OF BRITISH COLUMBIA, 1966-67

	Investment per Animal Unit	Investment per ranch	
		Amount	Per Cent of Total
	dollars	dollars	
Improved land.....	214	11,432	21.1
Unimproved land.....	236	12,633	23.4
House.....	104	5,565	10.3
Other buildings.....	66	3,539	6.5
Total real estate.....	620	33,169	61.3
Livestock.....	208	11,121	20.6
Equipment.....	178	9,543	17.7
Crops, feed and supplies.....	4	228	0.4
Total capital.....	1,010	54,061	100.0
Range in Total Capital Per Ranch dollars			
22,969 to 100,310			

TABLE 5—AVERAGE OPERATING STATEMENT FOR 24 PART-TIME RANCHES ON THE INTERIOR PLATEAU OF BRITISH COLUMBIA, 1966-67

	Per Ranch	Per Animal Unit
	dollars	
Current receipts.....		
Cattle sales.....	4,215	79
Other livestock sales.....	74	1
Crop sales.....	82	1
Custom work.....	531	10
Farm produce sales.....	83	2
Forest products.....	98	2
Total current receipts.....	5,083	95
Capital receipts.....	204	4
Net inventory increase.....	3,737	70
Total ranch receipts.....	9,024	169
Current expenses.....		
Real estate levies.....	370	7
Livestock purchases.....	1,533	29
Other livestock expenses.....	549	10
Equipment operating costs.....	1,218	23
Labor.....	272	5
Crop expenses.....	303	6
Irrigation, custom work, miscellaneous.....	247	4
Total current expenses.....	4,492	84
Capital expenses.....	3,046	57
Total ranch expenses.....	7,538	141
Family ranch income.....	1,486	28
Less: Interest on investment of 6 per cent.....	3,243	61
Unpaid family labor.....	354	6
Operator's labor income.....	-2,111	-39
Plus: Use of house.....	57	10
Farm produce used.....	288	5
Operator's labor earnings.....	-1,266	-24
Non-ranch income: employment.....	2,097	
other.....	312	
Total non-ranch income.....	2,409	
Ranges.....	dollars	
Total current receipts.....	1,170 to 14,710	
Total current expenses.....	1,051 to 25,839	
Family ranch income.....	-4,709 to 5,394	

Capital Investment

Total capital invested averaged \$54,061 a ranch or \$1,010 an animal unit. The total capital invested ranged from \$22,967 to \$100,310 per ranch. Real estate accounted for 61 per cent of the total investment, livestock 21 per cent and equipment 18 per cent (Table 4).

The average value of owned land was \$46 an acre. Irrigated land was valued at \$151 an acre, other improved land at \$115 and unimproved land at \$30 per acre.

Liabilities

At the close of the year, liabilities averaged \$8,040 per ranch, about 15 per cent of the average capital investment. During 1966-67, liabilities increased by an average of \$1,623 per ranch.

Ranch Income and Expenses

Current ranch receipts, of which about 83 per cent was from the sale of cattle, averaged \$5,083 per ranch and ranged from \$1,170 to \$14,710 (Table 5). Capital receipts, mainly trade-ins, averaged \$204 a ranch. The average inventory increased by \$3,737 during 1966; \$1,430 of the increase was in the beef herd.

Current expenses averaged \$4,492 a ranch and ranged from \$1,051 to \$25,839. Livestock expenses, of which \$1,533 was for the purchase of cattle, made up 46 per cent of the total current expenses, and the cost of operating equipment averaged \$1,218 or 27 per cent. Capital expenses averaged \$3,046 per ranch or \$57 per animal unit. Purchase of equipment averaged \$2,351 per ranch.

The return to the families for their labor, management and capital investment averaged \$1,486 and ranged from — \$4,709 to \$5,394. If the current rate

of interest is charged on the investment capital the average return to labor is negative.

In 1966 these part-time ranch operators had an average income from non-ranch operations of \$2,409. Income from off-ranch work averaged \$2,097 and ranged from no income to \$11,000 (Table 6). The forest industry provided 54 per cent of the non-ranch income. Other sources of non-ranch work were teaching, delivering mail, bookkeeping, guiding, carpentering, mining and cement working. Income from allowances, investments, pensions, compensation, etc., averaged \$312 per ranch.

SUMMARY AND CONCLUSIONS

A variety of industries provides a source of employment and secondary income for ranches with a small size of business. The forest industry was the largest single source of off-ranch employment, providing jobs for 38 per cent of the operators and more than half of the non-ranch income. The average ranch income was \$1,486, out of which the rancher had to support himself and his family and pay interest on capital invested in the ranch business. Non-ranch income averaged \$2,409 per ranch of which \$2,097 were from off-ranch employment.

Part-time ranching operations appear to have a more or less permanent place in the economy of the plateau area of the interior of British Columbia. Although the average ranch is small, it provides the operator with a home close to a source of non-ranch employment, adds to net income through reduced living costs, and gives some financial security in periods of unemployment.

NOTES AND REFERENCES

- (1) The Economics Branch and the British Columbia Department of Agriculture are doing an economic survey of the beef industry in British Columbia.
- (2) For information on some part-time ranch operations in in this area in 1958 see: Acton, B. K. and Woodward, E. D., *Cattle Ranching in British Columbia, 1958-1959*, Economics Division, Canada Department of Agriculture. The definition of a part-time ranch used in these studies differs, making a direct comparison of the ranches impossible.
- (3) *Regional Index of British Columbia*—January 1966, Bureau of Economics and Statistics, Department of Industrial Development, Trade and Commerce, Victoria, British Columbia.
- (4) An animal unit is one mature beef cow, bull or horse or the rated equivalent in other livestock and poultry.
- (5) A man-equivalent is the labor of one man or equivalent on the ranch for one year, that is 312 10-hour days.

TABLE 6—RANGE OF INCOME FROM OFF-RANCH WORK FOR 24 PART-TIME RANCHES ON THE INTERIOR PLATEAU OF BRITISH COLUMBIA, 1966-67

Range	Number of Ranches
dollars	
1 — 1,999.....	10
2,000 — 3,999.....	2
4,000 — 5,999.....	4
Over 6,000.....	2
No off-ranch work.....	6

PROSPECTS FOR STRAWBERRY PRODUCTION IN CANADA

Raziuddin M. Siddiqui

Strawberries are grown in commercial quantities in Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Ontario and British Columbia, and in small quantities in each of the other provinces. The farm value of strawberries averaged \$6.9 million a year during the period 1961-67, more than 10 per cent of the total farm value of all fruit. In terms of

farm value, strawberries have been vying with peaches as the second most important fruit crop in Canada. These crops are surpassed in importance by apples.

In 1966, a total of 7,108 farmers reported growing strawberries for sale. Of this number, 2,865 were in Quebec, 2,053 in Ontario, 635 in British Columbia,

TABLE 1—STRAWBERRIES: ACREAGE BY PROVINCES, CENSUS YEARS 1941 TO 1966

Year	Canada	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	British Columbia	Other*
					acres			
1941.....	10,652	58	588	507	2,898	4,160	2,291	60
1951.....	15,853	278	788	758	4,929	4,869	4,001	230
1956.....	15,690	595	646	742	5,086	6,009	2,266	346
1961.....	13,051	682	703	577	4,296	4,381	2,252	160
1966.....	12,836	672	892	697	4,375	3,431	2,592	177

* Includes data for Newfoundland, Manitoba, Saskatchewan, Alberta, Yukon and Northwest Territories.

Sources: (1) *Census of Canada, 1961, Agriculture*, Cat. No. 96-530, Vol. V, Part I, Dominion Bureau of Statistics.

(2) *Census of Canada, 1966, Agriculture*, Cat. No. 96-601, Vol. III, (3 - 1), Dominion Bureau of Statistics.

TABLE 2—STRAWBERRIES: SUPPLIES AND DISTRIBUTION, 1946 TO 1968 (CALENDAR YEAR)

Year	Production	Imports	Total Supply	Exports	Processed	Available for Domestic Use	Apparent Per Capita Disappearance*
			thousand pounds				pounds
1946.....	23,179	1,325	24,504	340	7,822	16,342	1.3
1947.....	34,463	4,186	38,649	1,069	15,975	21,605	1.7
1948.....	45,310	—	45,310	4,722	24,691	15,897	1.2
1949.....	35,992	6	35,998	3,255	15,636	17,107	1.3
1950.....	37,497	3,451	40,948	7,664	20,518	12,766	0.9
Average							
1946-1950...	35,288	1,794	37,082	3,410	16,929	16,743	1.3
1951.....	34,656	5,368	40,024	3,502	13,085	23,437	1.7
1952.....	43,614	6,959	50,573	6,031	15,249	29,293	2.0
1953.....	38,085	8,073	46,158	5,363	16,778	24,017	1.6
1954.....	37,267	8,212	45,479	1,102	15,558	28,819	1.9
1955.....	30,223	8,888	39,111	512	13,890	24,709	1.6
Average							
1951-1955...	36,769	7,500	44,269	3,302	14,912	26,055	1.8
1956.....	24,300	15,212	39,512	216	11,476	27,820	1.7
1957.....	21,815	20,249	42,064	40	12,244	29,780	1.8
1958.....	31,601	20,431	52,032	64	13,990	37,978	2.2
1959.....	28,307	19,330	47,637	77	14,864	32,696	1.9
1960.....	33,875	18,263	52,138	274	12,009	39,855	2.2
Average							
1956-1960...	27,980	18,697	46,677	134	12,917	33,626	2.0
1961.....	30,111	25,141	55,252	177	11,899	43,176	2.4
1962.....	34,016	21,277	55,293	128	13,748	41,417	2.2
1963.....	32,223	20,394	52,617	—	14,226	38,391	2.0
1964.....	41,463	21,062	62,525	—	18,350	44,175	2.3
1965.....	22,304	15,689	37,993	—	6,412	31,581	1.6
Average							
1961-1965...	32,023	20,713	52,736	61	12,927	39,748	2.1
1966.....	41,182	14,920	56,102	—	18,021	38,081	1.9
1967.....	43,881	15,245	59,126	—	16,676	42,450	2.1
1968.....	46,395	17,609	64,004	—	n.a.	n.a.	n.a.

n.a. = not available.

* No allowance for waste.

Sources: (1) *Value of Fruit Production*, Cat. No. 22-003, Dominion Bureau of Statistics.

(2) *Imports by Commodities*, Cat. No. 65-007, Dominion Bureau of Statistics.

(3) *Exports by Commodities*, Cat. No. 65-004, Dominion Bureau of Statistics.

(4) *Crop and Seasonal Price Summaries*, Markets Information Section, Canada Department of Agriculture.

612 in Nova Scotia, 509 in New Brunswick, 243 in Prince Edward Island, and 128 in Manitoba.

The fresh strawberry is one of the most difficult fruits to package and ship in a fresh state because of the rapidity with which the fruit deteriorates in quality. Until recently, the only means available to prolong the shelf life of strawberries and permit shipment to distant markets with a minimum loss of quality was refrigerated storage. A number of new methods of preserving the fruit and its appearance over longer periods have been developed and appear promising.

PRODUCTION

The area planted to strawberries in Canada was at its largest in 1951 when it totaled almost 16,000 acres (Table 1). Since that time the total acreage decreased steadily to 12,800 acres in 1966. Almost all of the decrease has been in the Province of Ontario

where there has been a very pronounced reduction in acreage since 1956.

Strawberry production fluctuates considerably from year to year. During the past 20 years annual production ranged from less than 22 million pounds in 1957 to more than 46 million pounds in 1968 (Table 2). On a five-year average basis production has been in the range of 28 to 35 million pounds. During the years from 1946 to 1968, the trend to an increase in production has been most evident in Nova Scotia and New Brunswick (Table 3). Production in Ontario and Quebec decreased during the 1950's and early 1960's but has increased in more recent years. Production in British Columbia decreased during the 1950's, has increased in recent years but with substantial fluctuations from year to year.

The annual average yield per acre of strawberries has varied from less than 2,000 pounds to more than 3,600 pounds. There is some evidence of an increas-

TABLE 3—STRAWBERRIES: PRODUCTION BY PROVINCES, CANADA, 1946 TO 1968

Year	Canada	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	British Columbia
thousand pounds							
1946-50.....	35,288	—	1,014	1,625	6,263	10,116	16,270
1951-55.....	36,769	762	1,081	1,083	8,063	11,045	14,735
1956-60.....	27,980	1,537	1,694	1,250	7,176	8,971	7,352
1961.....	30,111	2,375	2,875	1,750	5,125	9,982	8,004
1962.....	34,016	1,750	2,250	1,250	8,095	7,486	13,185
1963.....	32,223	1,938	2,500	1,875	8,198	5,626	12,086
1964.....	41,463	2,062	2,750	2,500	6,875	9,994	17,282
1965.....	22,304	2,000	2,500	1,625	2,494	9,476	4,209
1961-65.....	32,023	2,025	2,575	1,800	6,157	8,513	10,953
1966.....	41,182	1,375	2,625	1,625	9,062	9,615	16,880
1967.....	43,881	2,125	3,625	2,875	8,750	10,040	16,466
1968.....	46,395	1,312	3,125	2,862	9,500	13,388	16,208
1966-68.....	43,819	1,604	3,125	2,454	9,104	33,043	16,518

Source: *Value of Fruit Production*, Cat. No. 22-003, Dominion Bureau of Statistics.

TABLE 4—STRAWBERRIES: AVERAGE FARM PRICE BY PROVINCES, CANADA, 1946 TO 1967

Year	Canada	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	British Columbia
cents per pound							
1946-50.....	17	n.a.	17	16	17	18	16
1951-55.....	17	13	18	16	19	17	17
1956-60.....	17	18	19	19	17	17	17
1961.....	18	14	18	21	20	18	16
1962.....	18	18	19	21	18	18	17
1963.....	18	17	18	20	18	19	17
1964.....	19	18	20	22	21	21	17
1965.....	24	18	21	22	32	24	27
1961-65.....	19	17	19	21	22	20	19
1966.....	21	18	22	25	24	22	19
1967.....	20	18	18	19	22	24	17

n.a. = not available.

Source: *Value of Fruit Production*, Cat. No. 22-003, Dominion Bureau of Statistics.

ing trend in recent years but production per acre remains subject to large year to year variations. Average yields per acre are much lower in Canada than in the United States where during 1956-67 they averaged 6,800 pounds and in 1968 were 8,400 pounds.

PRICES

The national average farm price for strawberries was about 17 cents a pound between 1946 and 1960 (Table 4). During this period the price varied from a low of 14 cents a pound in 1952 to a high of 20 cents in 1955. The average farm price of 24 cents a pound in 1965 was a record high price for the 1946-68 period.

Provincial average farm prices range about the national average. Prices fluctuate from year to year and from province to province. Generally, prices in Prince Edward Island and British Columbia have been below the national average. Prices in Nova Scotia and Ontario have followed the national average closely while those in Quebec and New Brunswick have been higher.

IMPORTS

Canada imports substantial quantities of both fresh and frozen strawberries. United States is the main supplier of fresh strawberries and Mexico is a regular supplier of small quantities. Other suppliers of small quantities have been the Bahamas and New Zealand. Imports of fresh strawberries averaged more than 20 million pounds a year from 1961 to 1965,

compared with 1.8 million pounds during 1946-50 (Table 2).

There were practically no imports of frozen strawberries before 1955 (Table 6) when imports totaled 3.6 million pounds. During the three-year period 1966-68, imports of frozen strawberries averaged more than 11 million pounds a year. Mexico is the main supplier of frozen strawberries. Other suppliers are Bulgaria, Poland, the Netherlands, Rumania, Yugoslavia and the United States.

There are no imports of canned strawberries into Canada of any significance.

EXPORTS

Between 1946 and 1954, Canada exported a considerable quantity of fresh strawberries each year (Table 2). Beginning in 1958 exports practically stopped. In recent years the quantities of all forms of strawberries exported are so small that they are not reported by the Dominion Bureau of Statistics.

TABLE 5—SALES OF STRAWBERRIES TO PROCESSORS AS A PER CENT OF TOTAL HARVEST

	Average 1961-63	Average 1964-66
	per cent	
Ontario.....	35.7	14.6
British Columbia.....	83.7	94.9
Quebec and Maritimes.....	21.1	21.7
Canada.....	43.9	43.3

Source: H. Blum and M. Al Hashimi, *Marketing Fresh Strawberries in Ontario*, Farm Economics, Co-operatives and Statistics Branch, Ontario Department of Agriculture and Food, Toronto.

TABLE 6—FROZEN STRAWBERRIES: SUPPLIES AND DISTRIBUTION, CANADA, 1951 TO 1968 (CALENDAR YEAR)

Year	Beginning Stocks (Jan. 1)	Production	Imports	Total Supply	Ending Stocks (Dec. 31)	Domestic Disappearance
thousand pounds						
Average 1951-55.....	6,942	3,213	718	10,873	7,671	3,202
Average..... 1956-60.....	9,637	10,726	7,615	27,978	10,019	17,959
1961.....	11,576	13,716	8,157	33,449	11,040	22,409
1962.....	11,040	14,396	8,442	33,878	11,597	22,281
1963.....	11,597	12,507	8,227	32,331	9,765	22,566
1964.....	9,765	17,955	9,478	37,198	14,363	22,835
1965.....	14,363	8,444	18,065	40,872	9,965	30,907
Average 1961-65.....	11,668	13,404	10,474	35,546	11,346	24,200
1966.....	9,965	18,237	11,791	39,993	15,350	24,643
1967.....	15,350	16,825	11,484	43,659	12,055	31,604
1968.....	12,055	16,601	10,500*	39,156	13,428	25,728

* Estimated

Sources: (1) *Stocks of Fruit and Vegetables*, Cat. No. 32-010, Dominion Bureau of Statistics.

(2) *Canned and Frozen Processed Foods*, Cat. No. 32-212, Dominion Bureau of Statistics.

(3) *Imports by Commodities*, Cat. No. 65-007, Dominion Bureau of Statistics.

TABLE 7—CANNED STRAWBERRIES: SUPPLIES AND DISTRIBUTION, CANADA, 1946 TO 1968 (CALENDAR YEAR)

Year	Beginning Stocks (Jan. 1)	Production	Total Supply	Ending Stocks (Dec. 31)	Domestic Disappearance
thousand pounds					
Average					
1946-50.....	618	3,007	3,625	931	2,694
Average					
1951-55.....	1,966	4,014	5,980	2,283	3,697
Average					
1956-60.....	2,250	2,887	5,137	1,969	3,168
1961.....	1,741	3,257	4,998	2,062	2,936
1962.....	2,062	2,458	4,520	1,669	2,851
1963.....	1,669	2,475	4,144	1,185	2,959
1964.....	1,185	4,234	5,419	1,838	3,581
1965.....	1,838	1,827	3,665	839	2,826
Average					
1961-65.....	1,699	2,850	4,549	1,518	3,031
1966.....	839	3,453	4,292	1,334	2,958
1967.....	1,334	2,797	4,131	2,174*	2,857
1968.....	1,274*	3,194	4,468	1,228*	3,240

* Cannery only.

Sources: (1) *Stocks of Canned Foods*, Cat. No. 32-011, Dominion Bureau of Statistics.(2) *Canned and Frozen Processed Foods*, Cat. No. 32-212, Dominion Bureau of Statistics.

PROCESSING

The proportion of the domestic strawberry crop used for processing varies from year to year but usually is between 40 and 50 per cent. The proportion of the crop varies somewhat with the overall size of the crop. Generally, there is a trend for a smaller proportion of the total strawberry crop to be used for processing. The downward trend is particularly noticeable for Ontario where 35.7 per cent of the crop was processed during 1961-63 but only 14.6 per cent during 1964-66 (Table 5). In British Columbia the trend has been for a larger proportion of the crop to be processed.

The quantity of strawberries frozen each year has been increasing almost steadily from 5.3 million pounds in 1954, the first year for which data are available, to an average of more than 17 million pounds during the years 1966 to 1968 (Table 6). The quantity of strawberries canned each year has remained relatively unchanged during the period under review (Table 7).

Strawberries for processing usually are grown on larger acreages than those for the fresh market. The price to the producer is usually a few cents less per pound than for fresh fruit. Processing provides an outlet for undersized fruit and the overflow from the fresh market in years of high yields. At present,

processors import more than half of the strawberries they use, mostly in a frozen form.

DOMESTIC DISAPPEARANCE

The total quantity of fresh strawberries used annually in Canada increased from 16.7 million pounds during 1946-50 to an average of 39.7 million pounds during 1961-65 (Table 2). The estimated per capita consumption of fresh strawberries increased from 1.3 pounds to 2.1 pounds during this period.

The total quantity of frozen strawberries used annually in Canada also shows an increasing trend (Table 6). Total domestic disappearance averaged 27.3 million pounds a year during 1966-68, an increase of 10 million pounds a year over the average of 10 years earlier.

The total annual domestic disappearance of canned strawberries has changed little, remaining about 3 million pounds a year (Table 7). The per capita consumption of this commodity is small.

SUMMARY AND CONCLUSIONS

On a national basis, the production of strawberries in Canada does not show any significant trends. The acreage used to produce strawberries is decreasing in Ontario but increasing in most of the other provinces

where strawberries are produced in commercial quantities. The domestic disappearance of fresh and frozen strawberries has been increasing steadily. Imports of fresh and frozen strawberries are also increasing. Imports during 1961-65 were about equal to domestic production of fresh strawberries.

The average yield per acre of strawberries is low compared with that of the United States. It has been suggested that the average yield per acre in Canada could be increased substantially by use of production practices such as irrigation, improved cultural methods, and higher yielding varieties. The use of early and late varieties could extend the length of the marketing season. This should also result in a more even flow of production and eliminate the over-

supply problem that sometimes occurs at the peak of the harvest season.

Prospects for growing more strawberries in Canada appear promising because the quantity used each year is much greater than domestic production. The market for fresh and frozen strawberries is increasing because of population growth and increasing per capita consumption. However, this market requires continuity and availability of supply of good quality strawberries at competitive prices. If production can be made more efficient with greater yields per acre and lower per unit costs, and with some assurance of a reasonably stable supply of strawberries, the processing industry also could become a much larger and stronger market.

POLICY AND ADMINISTRATION OF PUBLIC LANDS IN ALBERTA WITH PARTICULAR REFERENCE TO AGRICULTURE (1)

T. F. Joyce

ADMINISTRATION

In Alberta as elsewhere, the formulation of policy with respect to public lands is concerned with the efficient utilization, allocation, development and conservation of this resource. To the greatest possible extent Crown land is employed on a multiple-use basis. An example is the Eastern Rockies Forest Conservation area where, although water conservation is of primary importance, the land is also used for timber, grazing, game production and recreational purposes. The changing social and economic structure of the province requires flexible and progressive public land use policies and it also requires an informed public to support those policies. To that end an Education and Information Branch has been established in the Department of Lands and Forests.

Alberta, the fourth largest province of Canada, has a total area of 255,285 square miles of which 248,800 square miles are land and 6,485 square miles are water. Just over half the province, 129,766 square miles, is provincial land that includes both provincial parks and provincial forests (Table 1). In comparison, federal lands amount to 26,127 square miles, just over 10 per cent of the province. This rather large percentage of federal lands is mainly due to the 20,717 square miles comprised of the five national parks within Alberta. Privately owned land or land in process of alienation from the Crown amounts to 99,392 square miles.

Of the total land area, 76,536 square miles are in agricultural use with more than half, 55.7 per cent, being improved (Table 1). There are 154,690 square miles of forested land of which nearly three-quarters, 73.4 per cent, is designated as productive or potentially productive. The remaining 17,574 square miles is classed as "other" and includes urban land, road allowances, grass and brush land and all waste land such as open muskeg, swamp and rock and also unclassified lands. The occupied agricultural lands are mostly confined to the southern half of the province and to the Peace River country. Potential agricultural lands in Alberta are extensive. It is estimated that in the Peace River region north of the 55th parallel there are 7 million acres of fair to good arable land in addition to 6 million acres of poor arable land that would require careful farming. Some 4 million acres of arable occupied land are covered with bush.

The Department of Lands and Forests Act assigns the administration of acts relating to lands, forests and other natural resources to the Minister of that Department. The Public Lands Act places all public lands under the Minister of Lands and Forests except those lands that are by virtue of any other Act or an order of the Lieutenant Governor in Council placed under the administration of another Minister or Crown Corporation. Most provincial lands are administered by the Lands Division, the Forestry Division and the Parks Division of the Department of Lands and Forests but other departments and authorities are involved. Of these the only one with a significant amount of land is the Department of Municipal Affairs which through the Special Areas Act administers some 220 townships in the dry, east-central part of the province where approximately 70 per cent of the land is public land and used mainly for grazing.

The Public Lands Act deals with the disposition of the public lands of the province. It empowers the Lieutenant Governor in Council to authorize the Minister of the Department of Lands and Forests to sell or exchange public lands or to set aside public lands for use as provincial parks, historical sites, natural areas, wilderness areas, forest reserves, forest recreation areas, game preserves, bird sanctuaries, public shooting grounds or for the development of any natural resource. The Act also empowers the Lieutenant Governor in Council to make regulations authorizing and governing dispositions of public lands. The Minister may classify lands and declare the use for which he considers them adaptable.

As the custodian of more than half the land area of the province, the Department of Lands and Forests is involved in every aspect of land inventory and planning. It surveys and assesses all public land resources. The type of land use programs and projects carried out is determined by the capabilities of the particular lands to satisfy public requirements, by an evaluation of alternative uses of the land as well as multiple use of the land, and by a consideration of relevant economic and social factors. The Department co-operates with ARDA in schemes to improve the utilization of the land resources of the

province and in the Canada Land Inventory which involves the classification and mapping of land according to its capabilities and limitations for agriculture, forest production, wildlife, sport fish, recreational use, waterfowl and present land use. For administrative purposes the Department is divided into four main Divisions: Lands, Forests, Fish and Wildlife, and Parks. There are also several service divisions.

The Lands Division is responsible for the disposition of land by sale, lease, permit, right-of-entry and easement covering more than 7.5 million acres of land. It administers tax recovery lands transferred from the Department of Municipal Affairs on the same basis as other provincial lands except that it transfers back to the Department of Municipal Affairs those which are to be sold. In its organization the Lands Division has the following sections: Special Land Use, Grazing, Appraisal, Homestead, Sales and Cultivation Leases, and Office Administration.

So that the government may acquire private lands where necessary, there is a land assembly program conducted by the Program Development Division of the Department of Agriculture. Through this program any agency of the government may arrange for the purchase of land needed for the effective conservation and efficient utilization of the land, forest, water and wildlife resources of the province. Upon acquisition of the property, the title is transferred to the Minister of Lands and Forests but the requesting agency maintains a reservation regarding the future use and disposition of such land. Private lands may also be obtained through an exchange for public lands.

DISPOSITION AND UTILIZATION

Agriculture

Important to agriculture but not affecting private lands is a classification system that for administrative purposes divides the province into three broad land-use zones: a forest zone, a settlement zone where settlement is permitted on approved land, and a settled zone in which most of the public land is under disposition, primarily grazing. Land classification personnel of the Lands Division co-operate with the Forestry Division in designating land in the forest zone that may be satisfactory for settlement. If the land is found to be suitable for farming, it is then placed in the settlement zone and made available for settlement on an orderly basis when it is deemed to be in the public interest. All lands receive a detailed appraisal and no sale or lease is made of any that are

unsuitable for agriculture. Before a newly surveyed township is opened for settlement, it is checked by the Department of Highways, the Water Resources Division of the Department of Agriculture and the Alberta Forest Service with regard to the location of roads, drainage, ditches, timber areas, etc.

Available and suitable public land remaining in the settled zone may be sold by agricultural farm sale to eligible applicants or by public auction sale to the highest bidder. In the settlement zone the alienation of the title to public lands commonly occurs in two ways: homestead sales and agricultural farm sales.

Homestead sales are made to anyone who is 18 years of age but not more than 70 years of age, who is a British subject or a Canadian citizen or who declares his intention of becoming a Canadian citizen. He must have resided in Alberta for at least one year in the three years prior to his application. If he owns or controls other land, it may not be more than three quarter sections. No attempt is made to assess his ability or capital resources. An acquisition of homestead land is limited to an amount that will bring the total owned, rented or leased land of the applicant and spouse to not more than one section of land. At least 50 per cent of the homestead land must be arable and it must be within 10 miles of his present farm. The purchase price is determined by an inspector of the Lands Division and it may be paid in equal annual instalments with a 4.5 per cent interest rate over a 10 to 20 year period. Flexible conditions apply to the date when the first instalment must be paid and to the date when the payment of taxes begins.

A homestead sale requires certain duties in regard to residence and to the amount of land that must be broken and seeded to crop each year. The building of a house may entitle the land purchaser to a credit but the construction of a house is not required. Title to homestead land may be obtained at any time after the purchaser has performed 12 months of residence, has an area under cultivation equal to that required to be under cultivation at the end of the fifth year of the contract, has paid the purchase price in full and has met other requirements of the sale. For the fiscal year ending March 31, 1968, there were 1,024 homestead sales issued amounting to 291,289 acres.

Agricultural farm sales are made to any established farmer who is a British subject or Canadian citizen, who owns a section or less and who is over 18 and under 71 years of age. He may privately purchase available public lands that are within two miles of his farm and two miles from his residence. The purchase is restricted to an amount that will bring the total owned land of the applicant and spouse to

not more than 800 acres. The price of the acquired land is based on the appraisal of the Lands Division. For the fiscal year ending March 31, 1968, there were 193 agricultural farm sales issued with a total of 35,011 acres of land.

Cultivation leases may be issued for available public land up to 320 acres where a minimum of 40 acres per quarter section is suitable for cultivation. The maximum lease period is 10 years and may be renewed. Breaking and cropping duties are prescribed. The lessee pays a cash rental that is a percentage of the assessed value plus an amount equal to the taxes. A rental adjustment is made in a poor crop year. Applicants must be farming in Alberta and fulfill age, citizenship and residence qualifications. Cultivation permits authorize the permittee to crop cultivated land and to pasture livestock on the uncultivated land on a calendar year basis. There were 753 cultivation leases in force at March 31, 1968, covering 146,485 acres of public lands.

Approximately 4.5 million acres of public lands were under grazing lease March 31, 1968 and there were 4,285 leases in effect. Grazing leases may be applied for by anyone 18 years of age and over who is a Canadian citizen. Corporations may also qualify under certain conditions. The area of land leased cannot exceed an area sufficient to graze 600 head of cattle unless the granting of a larger area would not adversely affect other farmers or ranchers in the vicinity. The rental and tax rates vary from year to year. The rental is a percentage of the forage value of the land as established for the district in which it is located, the forage value being determined by a formula which takes into consideration the grazing capacity of the land, the average gain of cattle on grass and the average sale price of cattle sold in Calgary during the preceding year or the portion thereof selected by the Minister. A lessee may be given a lease for a term not exceeding 20 years and toward the end of the term he may apply for a renewal. Provided that certain conditions are met, leases may be assigned and an appropriate assignment fee is charged. Upon the expiration or assignment of a lease improvements may be either sold or removed. Lessees must use grazing leases in accordance with proper conservation and range management practices. With the department's permission, the lessee may break, cultivate and establish forage crops for his exclusive use on designated acreage and recover the costs by a waiver of payment of additional rent for a period up to five years. For regrassing abandoned cultivation, water development and range improvement projects a lessee may be granted assistance to a maximum of 25 per cent of his cost, such

assistance to apply as a credit to his lease rental and taxation account.

A considerable amount of grazing land in Alberta is held by grazing associations. As of March 31, 1968, there were 81 grazing associations occupying 820,340 acres of land on which 1,428 patrons pastured 47,352 head of stock. Eight associations held annual permits covering 93,987 acres. As of the same date the Grazing Section of the Lands Division operated seven dryland and four irrigated grazing reserves or community pastures that comprised 224,774 acres serving 636 patrons, 57,485 animal units being allotted. Locations have been selected for a further 17 proposed grazing reserves to be developed and operated by the Lands Division. By special administrative arrangement with the federal government local patrons may graze cattle and cut hay on federal lands or federally controlled provincial lands in the Vauxhall and Wainwright areas.

Public lands in the Special Areas of Alberta include both unalienated lands and tax recovery lands. Allocation of these lands is determined by the Special Areas Board under the Department of Municipal Affairs. The tenure is by lease and permit issued pursuant to the Special Areas Act and the Public Lands Act. Grazing leases are for a term of 20 years and cultivation leases for a term of 10 years, both agreements providing for renewal. Unless special permission can be obtained, no grazing lease provides for an area greater than that required to graze 400 head of cattle.

The Lands Division uses Crown lands to promote farm enlargement and consolidation to the greatest possible extent. Through the establishment and development of community pastures and other grazing lease arrangements, progress has been made in enabling farmers and ranchers to form economic farm and ranch units. Under the Public Lands Act and pertinent regulations, it is the policy to dispose of land in such a way as to permit establishment of economic farm sizes through homestead sales and agricultural farm sales. In certain designated areas of the province, farm adjustment committees have been established. All applications for public land are referred to these committees and they make recommendations to the Minister of Lands and Forests on disposition of the public lands applied for. Some public land is exchanged for private land for farm consolidation purposes.

Forestry

The Alberta Forest Service of the Department of Lands and Forests administers and manages approximately 150,000 square miles of forest in accordance

with the Forests Act and regulations established thereunder. In organization the Division has five Branches: Forest Management, Forest Protection, Forest Surveys and Planning, Forestry Training, and Administration. There are 11 provincial forests composed of Ranger Districts each under a District Forest Officer responsible to his superintendent. The Division classifies all forested land according to its timber potential and its present timber stand. It co-operates with the Lands Division in delineating permanent forest lands, multiple-use lands and agricultural lands. It approves and supervises the use of designated forest land for purposes other than forestry, i.e., oil and mineral development, recreation and the grazing of domestic animals. In 1966 the Division implemented a new timber quota system whereby licencees receive quotas at an appraised rate of dues and whereby constant timber supplies are

ensured within the allowable cut limitations of each forest management unit. License holders accept responsibility for reforestation in the areas in which they operate. Controlled grazing is permitted in forested land adjacent to settled areas. During the fiscal year ending March 31, 1967, grazing permits within the Rocky Mountains Forest Reserve afforded pasturage to 26,296 head of cattle, horses and sheep. In the forest zone outside the Rocky Mountains Forest Reserve most of the grazing took place on approximately 300 grazing leases.

Fish and Wildlife

By virtue of the Game Act and regulations under that Act the Fish and Wildlife Division of the Department of Lands and Forests is entrusted with the efficient management, conservation and development

TABLE 1—TOTAL LAND AND WATER AREA OF ALBERTA CLASSIFIED BY TENURE AND USE

	Square Miles	Per Cent
Total Land Area.....	248,800	97.5
Total Fresh Water Area.....	6,485	2.5
Total Area of Province.....	255,285	100.0
Tenure (circa) 1966		
Federal Lands		
(1) National Parks.....	20,717	8.1
(2) Indian Reserves.....	2,541	1.0
(3) Other.....	2,869	1.1
(4) Total.....	26,127	10.2
Provincial Lands		
(1) Provincial Parks.....	2,321	0.9
(2) Provincial Forests.....	9,267	3.6
(3) Other.....	118,178	46.4
(4) Total.....	129,766	50.9
Privately owned land or land in process of alienation from the Crown.....	99,392	38.9
Total Area of Province.....	255,285	100.0
Use in 1967:		
Occupied Agricultural Land		
(1) Improved.....	42,619	17.1
(2) Unimproved.....	33,917	13.6
Total.....	76,536	30.7
Forested		
(1) Productive.....	113,667	45.7
(2) Non-Productive.....	41,023	16.5
(3) Total.....	154,690	62.2
Other.....	17,574	7.1
Total Land Area.....	248,800	100.0

Source: *Canada Year Book 1968*, pp. 7, 30 and 466.

of the fish and wildlife resources of the province. It conducts research to implement new management techniques for greater utilization of the economic and recreational potential inherent in the fish and wildlife resource. It is presently giving attention to those areas where light resource utilization occurs especially in the northern half of the province. Through the Lands Division arrangements are made for the reservation of lands that are prime habitat for fish and game and that give access to such areas. Recommendations are also made to the Lands Division in regard to land clearing on grazing leases and grazing reserves to protect wildlife habitat and populations.

Parks

The Provincial Parks Division of the Department of Lands and Forests establishes, operates and develops provincial parks. These are found in most parts of the province from Peace River in the north to Milk River in the south and from the British Columbia border to the Saskatchewan border. They account for more than 2,000 square miles of public lands. The Provincial Parks Act provides for a Board that assists the Minister of Lands and Forests in the formulation of policies for the administration and development of parks. By the Parks Act the Lieutenant Governor in Council is granted the power to designate any Crown land as a park and he may authorize the Minister of Lands and Forests to purchase, expropriate or otherwise acquire land for park use. Parks are deemed to be for the recreation and general benefit of the people, for the maintenance

and production of native plant and animal life and for projects of geological, ethnological, historical, or other scientific interest. The parks system comprises parks of the following types: parks, recreational areas, historical sites, natural areas, wilderness areas and roadside campsites. The leasing of lands for permanent residence or summer cottage use is not considered to be compatible with park purposes. Except for wilderness areas, parks are game reserves. The grazing of domestic animals is not permitted.

Water Resources

The Water Resources Division of the Alberta Department of Agriculture administers Acts which relate to the utilization, conservation and development of the water resources of the province. It measures, surveys and assesses all water sources. It investigates, forms and plans water development projects in the dry areas of the province. It constructs drainage, irrigation, water supply, river control and erosion works.

ACKNOWLEDGMENTS

- (1) For the most part, this article is based on annual reports of the Lands, Forests, Fish and Wildlife, and Parks Divisions of the Alberta Department of Lands and Forests, the Annual Reports of the Alberta Department of Agriculture, and "The Administration of Alberta's Public Land", an address by Dr. V. A. Wood, Deputy Minister, Alberta Department of Lands and Forests, to the Western Stock Growers Association, February, 1968.
- (2) The writer expresses his appreciation to Dr. Wood for his review of the article.

POLICY AND PROGRAM DEVELOPMENTS

Interim Sugar Beet Deficiency Payment—The Agricultural Stabilization Board has been authorized to make an interim deficiency payment on the 1968 sugar beet crop at the rate of \$2.50 per standard ton of beets (250 pounds of sugar).

The support level for the 1968 sugar beet crop is \$15.98 per standard ton. Final payments will likely be made in mid-December, 1969. (February 5, 1969)

Ontario Tender Fruit Grower's Marketing-for-Processing Order—In February 1968, the Ontario Tender Fruit Growers' Marketing Board received authority to collect levies at the rate of \$4.00 per ton of Bartlett pears marketed, \$4.00 per ton of cherries

marketed, \$2.00 per ton of Kieffer pears marketed, \$2.00 per ton of peaches marketed and \$2.00 per ton of plums marketed for the period up to December 31, 1968.

By Order in Council, the period for which the levies may be collected has now been extended to December 31, 1969. (February 18, 1969)

Ontario Grape Growers' Marketing-for-Processing Order—An Order in Council has authorized the Ontario Grape Growers' Marketing Board to extend the period for which levies may be collected at the rate of \$5.00 per ton of grapes marketed, to December 31, 1969. (February 18, 1969)

PUBLICATIONS

ECONOMICS BRANCH PUBLICATIONS

An Economic Appraisal of Proposed Agricultural Development and Cattle Ranching in the Slave River Lowlands, Northwest Territories, Stutt, R. A., Economics Branch, Canada Department of Agriculture, Ottawa, Pub. No. 68/17, December, 1968. pp. 83+x.

This is the report of the economic part of an appraisal of the possibilities of the Slave River Lowlands as an area for beef cattle ranching. This investigation included a study of agricultural experiment data in adjacent northern areas, of transportation, of the current and future demand for beef and of the operations of ranch businesses.

UNITED NATIONS PUBLICATIONS

Available in Canada from the Queen's Printer, Ottawa

Food and Nutrition Procedures in Times of Disaster, Masfield, G.B., Department of Agriculture, University of Oxford, England, for the Food and Agriculture Organization of the United Nations, Rome, 1967, pp. 88.

This handbook stresses the practical aspects of food management in times of disaster. It was written in compliance with a recommendation of the Joint FAO/WHO Expert Committee on Nutrition.

Topics covered in this book are the appraisal of existing food supplies, rationing, methods of distribution, price control, and first aid for nutritional relief.

Fertilizers, An Annual Review of World Production, Consumption and Trade, 1967, Food and Agriculture

Organization of the United Nations, Rome, 1968. pp. viii +211.

The purpose of this review is to record and analyze the production, trade, consumption and prices of fertilizers in the world as a whole and in the different countries and continents. The Appendix contains tables giving detailed data for each country.

OTHER PUBLICATIONS

Not available from the Economics Branch

The Country Grain Elevator Industry in Ontario, Sorflaten, Allen G., Farm Economics, Co-operatives and Statistics Branch, Ontario Department of Agriculture and Food, Toronto. pp. 42.

This report is a description of the facilities for handling grain in Ontario country elevators. An assessment of the adequacy of these facilities is made, taking into account such factors as the structure of the elevator industry, the characteristics of grain production in Ontario, and transportation and merchandising methods.

Basic Herd, Farm Income Tax Problem, Bayda, M.W. Production Economics Research Branch, Economics Division, Alberta Department of Agriculture, Edmonton, 1969. pp. 15.

This bulletin contains an explanation of how the "basic herd" concept may be used in calculating farm income taxes.

A Historical Series of Agricultural Statistics for Alberta, Statistics Branch, Economics Division, Alberta Department of Agriculture, Edmonton, Pub. No. 850, 1969. pp. 139.

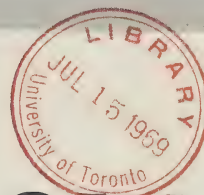
Statistics on all aspects of agriculture, from 1905 to 1966, are presented in tabular form in this publication.

VOLUME 4

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CANADIAN FARM ECONOMICS



- Grain Corn and Orderly Marketing... G. G. Pearson 1
- Factors Affecting the Production of Tomatoes for Processing... J. L. Pando 8
- Some Marketing Habits of Prairie Grain Producers... D. Zasada 15
- Characteristics of Holders of Small Dairy Quotas, 1967-68... W. Y. Yang 20
- Costs of Operating Aircraft for Agricultural and Forestry Use, 1967... L. E. Philpotts and T. O. Riecken 24
- The International Labour Organization and Canadian Agriculture, 1919 to 1969... A. B. Andarawewa 30
- Policy and Program Developments... 37
- Publications... 32

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CANADIAN FARM ECONOMICS

GRAIN CORN AND ORDERLY MARKETING (1)

G. G. Pearson

During the past year and a half there has been much discussion in Ontario, on the merits of establishing a more orderly marketing system for grain corn. Grain corn production has increased rapidly in Ontario but little development has occurred in the marketing system. Ontario corn prices are closely related to United States corn prices but potential exists for the creation by Ontario corn producers of a marketing system which could stabilize corn prices and improve the level of income derived from corn without resorting to excessive trade restrictive practices. This article attempts to put into perspective the various factors which operate to determine the level of prices and incomes to corn growers, and to relate the concept of orderly marketing to this process.

GRAIN CORN FLOW PATTERNS 1966-67

The flow of Canadian and United States corn through Eastern Canadian marketing channels and facilities during the crop year 1966-67 (August 1-July 31) is illustrated in Figure 1. The figure was derived from data published by the Dominion Bureau of Statistics, the Board of Grain Commissioners, the Ontario Department of Agriculture and Food and the United States Department of Agriculture (2).

Among other things, Figure 1 reveals that 58 per cent of the 65.1 million bushels of corn produced in Ontario in 1966-67 was consumed by livestock on the farm on which it was produced or on neighbouring farms, without ever entering commercial market channels, except perhaps for custom grinding. Another 23 per cent moved off the farms into commercial channels such as country elevators, feed mills and terminal elevators, and then back to farms in Ontario as livestock feed. Two per cent went for livestock feed in the provinces east of Ontario. In total, an estimated 53.9 million bushels or 83 per cent of Ontario corn production in 1966-67 went either directly or indirectly into livestock production in Canada, with the balance of 10.9 million bushels (17 per cent of Ontario production) going into food and industrial processing. Nearly 0.4 million bushels or less than 1 per cent went for seed.

Of the 49.3 million bushels of United States corn which moved into Canada in 1966-67, 26.2 million or 53 per cent was trans-shipped through eastern terminal elevators to overseas markets. Only 22.8 million bushels of the United States corn was actually imported into the Canadian domestic market, with 5.5 million bushels going into Ontario livestock production, 8.0 million going into Quebec livestock production, 9.3 million going into Canadian food and industrial processing, and 0.3 million bushels into storage.

Canadian food and industrial processors utilized 20.2 million bushels of corn of which an estimated 54 per cent was Ontario corn, and the balance was United States corn. Of the 58.3 million bushels of corn consumed by livestock in Ontario, 91 per cent was Ontario corn and the remainder was from the United States. An estimated 10.2 million bushels of corn went for livestock feed in other parts of eastern Canada (largely Quebec), of which 78 per cent was United States corn, with the balance being composed of 11 per cent each of Ontario and Quebec corn.

The flow of corn through the system from production to consumption is carried on simultaneously with the flow of other grains. The flow of all these grains is accomplished through the efforts of many individuals, companies, dealers and associations who endeavour to add "utility" or make the grains more valuable to the consumer by transporting, handling or processing them.

DEMAND, SUPPLY AND PRICE DETERMINATION

The general level of corn prices in Ontario reflects very closely the general level of corn prices prevailing on the major United States markets. In addition, other factors such as the local supply and demand situation for Ontario corn, the level of western grain prices, transportation costs and differentials, marketing margins, and the exchange rate operate to deter-

FLOW CHART OF GRAIN CORN IN CANADA 1966-67

MILLIONS OF BUSHELS

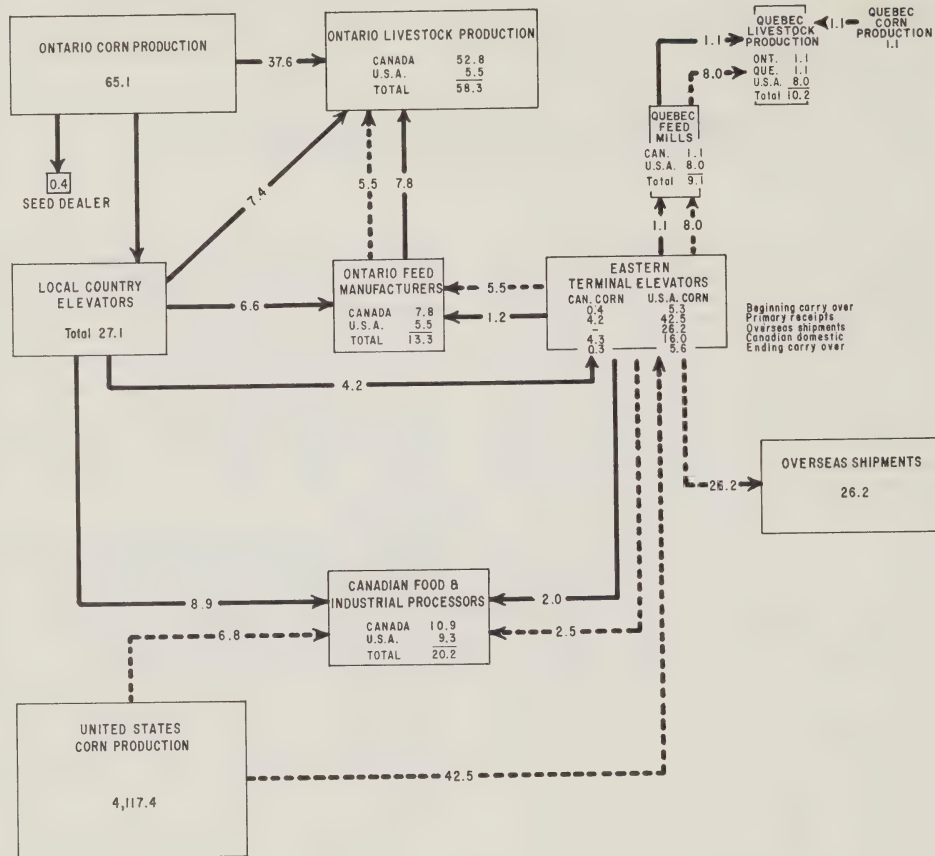


FIGURE 1

mine prices received by corn producers. A. G. Sorflaten gives a good description of corn price-determining procedures in a recent study:

"Using Chicago future prices (for corn . . .) and taking into account transportation charges and exchange rates on American currency as well as local demand—supply conditions, grain brokers, dealers, and processors make daily bids to local elevators for their cash grain. The local elevator then chooses the best bid, from which it deducts its margin (the charge for its services). The best bid minus the margin is the

price the country elevator quotes to growers that day.

Grain prices may vary from one locality to another due to (1) variable conditions of demand and supply, (2) transportation differentials between regions, and (3) congestion of elevator facilities at country points."(3).

Figure 2 depicts the close relationship between the price of Chicago corn on a c.i.f. basis, Toronto and the price of Chatham corn, f.o.b. track. The general price level for corn in the United States is determined by the demand for corn in the U.S. domestic market,

the demand for U.S. corn in export markets, the level of U.S. corn production, the level of sealed storage stocks, and the availability of "free corn" (corn produced outside the Feed Grain Program). The capacity of U.S. farmers to produce corn and other feed grains exceeds current demand. To prevent accumulating surpluses and falling prices, the United States Government operates a voluntary Feed Grain Program to limit production and manage supply in an attempt to meet the current needs of both the domestic and export markets at prices above specified levels. Ontario corn production is very small relative to United States corn production and has a limited impact on United States price levels. However, since Ontario corn competes directly with United States corn in some phases of the Canadian market, the price level of Ontario corn is very sensitive and reacts to variations in the price level of United States corn.

Both the Chatham price and the Chicago price (c.i.f. Toronto) normally follow a seasonal pattern of being low in the fall (reflecting heavy fall marketings in both countries) and rising as the season progresses. The price differential (the difference between the two price levels—see Figure 2) also follows a seasonal pattern and is normally greatest in the harvest months of October and November when large quantities of Ontario corn are put on the market in competition for limited elevator drying and handling facilities. The differential is often so great in the fall that Ontario corn may move to Toronto and further points east in direct competition with imported U.S. corn. In fact, however, only a small portion of total production actually moves that far east, but all the corn that is sold in the fall months, no matter what the destination, receives the same price. The Chatham price responds very rapidly to decreases in the

PRICES FOR No. 2 YELLOW CORN, 1962 to 1968

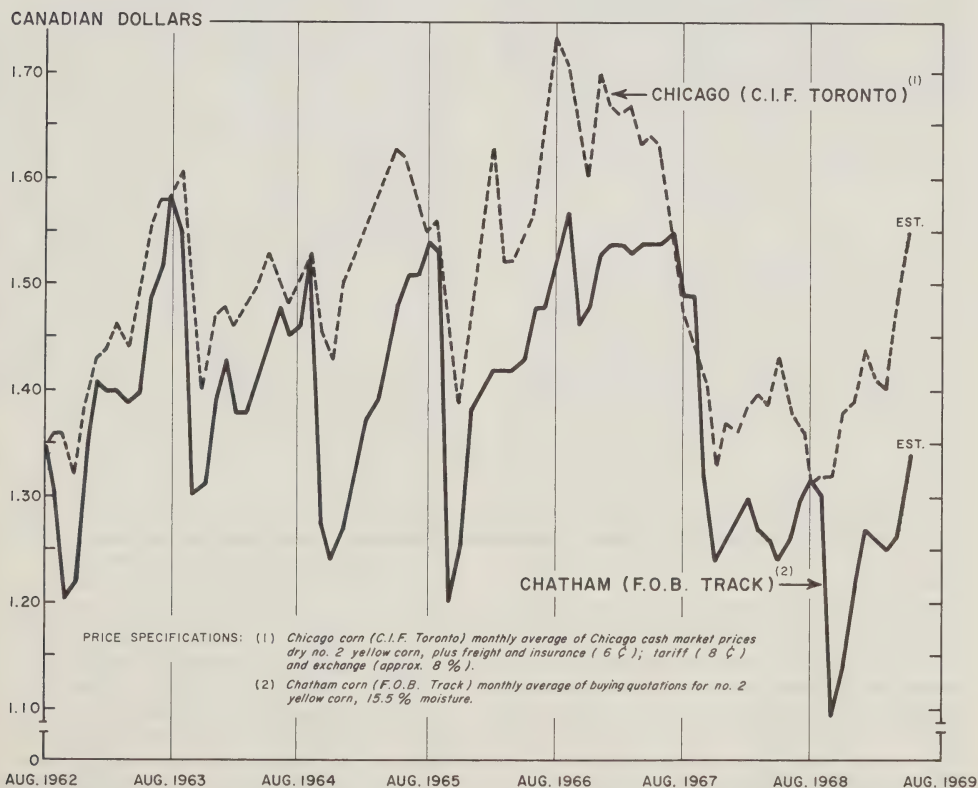


FIGURE 2

Chicago price (c.i.f. Toronto) but is sluggish in responding to increases in the Chicago price. Thus, once the Chatham price becomes depressed relative to the Chicago price (c.i.f. Toronto) in the fall because of more corn coming to market than the Southwestern Ontario market area can handle, it remains depressed well into the marketing season. As the season progresses the price differential narrows reflecting the shifting of Southwestern Ontario from an export basis to an import basis.

In summary, the general level of Ontario corn prices over time tends to be closely associated with the general level of United States corn prices and reflects the interaction of supply and demand forces operating on United States markets over which Canadians have limited control. However, the seasonal fluctuations in the differential between Ontario corn prices (f.o.b. Chatham) and United States corn prices (c.i.f. Toronto) are symptomatic of underlying structural problems in the marketing of Ontario corn. More orderly marketing of Ontario corn could minimize the price differential between Ontario and United States corn and thus stabilize and increase returns from the sale of Ontario corn. Ontario producers themselves are in a position to take action to ensure a more orderly and planned flow of Ontario corn to market throughout the season.

DEMAND AND SUPPLY PROJECTIONS TO 1975-76

It is worthwhile to consider the recent trends in utilization and supply of corn in Ontario and to project these trends into the future to see what direction the Ontario corn industry is heading. The trends during the five-year span 1962-63 to 1966-67 are therefore projected to 1975-76. It is assumed that marketing and pricing practices and government policies in existence during the base period will continue unchanged. It must be clear that these are projections,

and not predictions, based on conditions prevailing during the base period. There are many factors currently operating which are capable of altering these projections quite substantially either way.

The demand or utilization projections for Ontario corn to 1975-76 are summarized in Table 1. The total demand for Ontario corn is projected to be 136.6 million bushels. When the production trend during the base period is extended to 1975-76 production is also projected to be 136.6 million bushels. The equality between projected demand and supply occurs because during the base period there was essentially no carry-over of Ontario corn, indicating that consumption was increasing at the same rate as production. It is possible that the market for Ontario corn may become temporarily or even permanently saturated before 1975-76. A symptom of such saturation would be the presence of growing carry-overs, but the trends as yet do not indicate such an occurrence.

INTERNATIONAL TRADING RULES

Today about 30 per cent of Canada's agricultural production is exported and exports have averaged about \$1.6 billion annually during recent years. All Canadian agricultural producers (as well as many other Canadians) have a stake in the export performance of Canadian agriculture whether or not they produce directly for an export market. Because of the continued dependence of the Canadian economy on sound performance in export markets, the basic thrust in Canadian trade policy is in general to freer international trade. It is generally accepted that Canada, as one of the major exporting nations of the world, has more to gain than to lose through freer trade. Greater access to foreign markets for Canadian products, including agricultural products, would promote Canada's economic growth and provide jobs for Canadians.

TABLE 1—SUMMARY OF DEMAND AND PRODUCTION PROJECTIONS OF ONTARIO CORN TO 1975-76

Demanded by	Average 1962-63 to 1966-67	Projected 1975-76
million bushels		
Canadian food and industrial processors.....	7.0	22.8
Livestock production—Ontario.....	40.9	110.0
Livestock production—outside Ontario.....	0.9	3.0
Seed.....	0.3	0.8
Total demand for Ontario corn.....	49.1	136.6
Total production of Ontario corn.....	49.1	136.6

The General Agreement on Tariffs and Trade (GATT) is an international contract which regulates trade among the countries which have signed it and to which Canada must adhere as part of her international obligations. Canada has agreed under the GATT not to raise the level of the tariff, not to alter the method of determining dutiable value nor to impose restrictions of any other kind against imports which would have the effect of impairing the terms of access stated in the Agreement. Under GATT, Canada has undertaken an obligation not to impair the terms of access to the Canadian market for imported corn. The present terms of access constitute a tariff of eight cents a bushel. This tariff is contained in the Canadian tariff schedule which forms part of the General Agreement and under this contract it is bound against increase.

This is not to say that, once Canada has entered into a GATT commitment and, as in this case, bound the tariff on corn, Canada cannot change its tariff level. In order to do so however, certain rules must be observed. It is possible, for instance, to re-negotiate the existing tariff level. To do this would require compensating the countries supplying corn to our market in return for the right to charge a higher duty against their imports.

Further, under the "escape clause" provision of the GATT, Canada can take temporary emergency action against imports when they are entering Canada under such conditions as to cause or threaten serious injury to domestic producers. Within the GATT context temporary action may be taken under the Canadian Custom Tariff Act. When an emergency situation occurs, a surtax may be applied by the Governor-in-Council on advice by the Minister of Finance.

The use of quantitative import restrictions is, in general, prohibited under the GATT. Such restrictions may be permitted however, if they are deemed necessary for the operation of government measures designed to restrict the production or marketing of the same product domestically. Even under such circumstances however, imports cannot be prohibited entirely but must be allowed to enter in the same proportion to domestic production as might reasonably be expected to prevail in the absence of restrictions.

In considering the desirability of restrictive action of any kind against imports, the Government must take into account a number of factors in addition to the difficulties of the particular sector of agriculture requesting the action. The Government must bear in mind the overall reliance of the Canadian economy on export markets and attempt to judge the impact which any restrictive action in one sector may have, not only on other agricultural sectors, but also on

other sectors of the economy as well. It may be possible to confine the impact to the sector involved but usually it is not. Our exports of other products may be affected by retaliatory action by the countries hit by our restrictive action. Even if negotiations avert retaliation, compensatory reductions in tariffs on our part often affect other sectors than the one directly involved in the action. In addition to the direct effects of taking restrictive action against imports, there is also the danger that we may be providing unintentional support for protectionist pressures in other countries which could have long-run and far-reaching effects on all Canadians.

CORN MARKETING PROBLEMS IN ONTARIO

Corn marketing in Ontario faces a number of problems at the present time. Some of the more critical ones are: (1) The details of the corn marketing system have not grown in size, sophistication, or efficiency in line with the rapid increase in production. For example, there are inadequacies in the pricing system, price reporting, delivery control and movement, storage and grading. (2) There is lack of co-ordination in marketing with a disproportionate volume of corn coming to market at harvest, thus depressing the price relative to what it might be if marketings were more orderly. (3) The bargaining strength of individual corn growers against buyers is limited to the ability of the seller to hold his corn off the market in hopes of a better price.

WHAT COULD A CORN MARKETING BOARD DO?

There are several ways of approaching corn marketing problems in Ontario. One of the ways which has been suggested is the marketing board approach, although it must be recognized that there are both pros and cons to this approach. A board could conceivably do the following:

1. It could establish an orderly marketing procedure, such as a system of delivery permits, to even out the flow of Ontario corn moving into the market and thus prevent the usual harvest glut of corn.

2. It could provide cash advances to farmers as an incentive to hold corn in farm storage until later in the season. A guarantee for such advance payments could be provided under the federal Agricultural Products Co-operative Marketing Act, by an agreement between the board and the Minister of Agriculture.

3. It could provide encouragement to farmers to utilize the accelerated depreciation provisions under the Income Tax Act, to construct additional farm

drying and storage capacity. This provision expires at the end of March 1970. A board could encourage the construction of or could construct storage facilities in locations calculated to improve the flow and handling of corn.

4. It could operate a pooling system for corn, complete with initial payments to producers and final payments depending on the value of sales made.

5. It could negotiate contracts guaranteeing future delivery of corn to food and industrial processors or other users. It could negotiate with elevators and grains handlers charges to be levied for the performance of specific services in relation to corn. It could negotiate with shipping, railway and trucking companies for lower rates on the movement of large volumes to specific destinations.

6. A board could control inter-provincial movement of corn to other provinces by delegation of federal authority under the Agricultural Products Marketing Act.

7. As long as the board had essentially monopoly control over the marketing of the corn crop, it could follow a pricing policy of maximizing returns from every market in which Ontario corn is sold. It could sell corn at different prices in different markets depending on the price and availability of substitutable grains. It could concentrate on maximizing revenue from sales of corn within or closely adjacent to the corn growing areas, however it could also explore the possibility of selling part of the crop in more distant markets such as Toronto, Montreal or overseas at prices competitive with other grains.

8. A board could co-ordinate the growth of the corn industry and could work with other agencies in the establishment of improved market reporting and grading.

The suggestions which have been made are only a few of the many possibilities which exist for a corn marketing board. On the other side of the coin, it must be acknowledged that there are a number of problems or disadvantages associated with the marketing board approach. Some examples are: producer freedom of action in selling may be limited; improved production efficiency may be discouraged; buyer purchasing options may be restricted; entrepreneurial operation on the market may be discouraged; supply and demand forces may be distorted in such a way as to retard market efficiency; and board administration may become overly complex, cumbersome, and costly.

SUMMARY AND CONCLUSIONS

The solutions to the real problems facing Canadian agriculture, including the corn industry must be of a long-term and fundamental nature if they are to

promise success. Through co-operation among corn producers, trade officials and governments much potential exists for improving the marketing and pricing of Canadian corn without resorting to trade restrictive practices. More than four-fifths of Ontario corn production ultimately goes into live-stock production which must compete on what is virtually a North American market.

The general level of Ontario corn prices tends to reflect very closely the general level of corn prices prevailing on United States markets, over which Ontario producers have little influence. On the other hand the depression of Ontario corn prices relative to U.S. corn prices during the fall months is symptomatic of underlying structural problems in Ontario corn marketing, which producers themselves are in a position to correct. Utilization and production of Ontario corn have been growing at the same rate and by 1975-76 it is projected that both will be in balance at about 137 million bushels.

It is generally accepted that Canada has more to gain than to lose, in terms of economic growth and employment, through freer international trade and greater access to foreign markets. Under GATT, Canada is obliged by contractual arrangement not to engage in unnecessary international trade restrictive practices, which might impair Canada's performance in export markets.

Ontario's corn marketing problems generally revolve around the lag in growth of marketing practices behind the growth in production capacity. There is, in general, disorderly corn marketing and limited producer bargaining power in price determination. A producer's marketing board could do much to solve corn marketing problems and maintain competitive pricing without resorting to international trade restrictive practices.

ACKNOWLEDGEMENTS AND REFERENCES

- (1) The helpful assistance of G. A. Hiscocks and E. W. Stewart, Economics Branch, Canada Department of Agriculture, in preparation of this article is gratefully acknowledged.
- (2) *Handbook of Agricultural Statistics, Part I — Field Crops*, Cat. No. 21-507, *Annual Census of Feed Manufacturers*, 1966, Cat. No. 32-214, *Annual Census of Flour Mills*, 1966, Cat. No. 32-215, *Annual Census of Breweries*, 1966, Cat. No. 32-205, *Annual Census of Distilleries*, 1966, Cat. No. 32-206, *Annual Census of Breakfast Cereal Manufacturers*, 1966, Cat. No. 32-204, *Annual Census of Miscellaneous Food Industries*, 1966, Cat. No. 32-224, Dominion Bureau of Statistics, Ottawa.

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Sorflaten, A. G., *The Country Grain Elevator Industry in Ontario, Part I*, Farm Economics, Co-operatives and Statistics Branch, Ontario Department of Agriculture and Food, Toronto, January 1969.

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- (3) Sorflaten, A. G., *The Country Grain Elevator Industry in Ontario, Part I*, Farm Economics, Co-operatives and Statistics Branch, Ontario Department of Agriculture and Food, Toronto, January 1969, p. 38.

POLICY AND PROGRAM DEVELOPMENTS

Manitoba Turkey Marketing Order — An Order in Council authorized the Manitoba Turkey Producers' Marketing Board to regulate the marketing, in inter-provincial and export trade, of turkeys produced in Manitoba. (March 11, 1969)

Hog Quality Premium Change — Effective March 31, 1969, the hog quality premium of \$3 will be paid only on carcasses with an index score of 105 or higher. (March 25, 1969)

Federal-Provincial Crop Insurance Program For Quebec — An experimental crop insurance program to assist Quebec farmers has been established. The plan is divided into three parts: (1) insurance for forage and grain crops used as livestock feed, (2) a special insurance plan for flue-cured tobacco, and (3) a special insurance plan for cash crop production of forages and grains. (March 27, 1969)

Dairy Support Prices, 1969-70 — The support price for manufacturing milk for the year commencing April 1, 1969 was set at \$4.85 a 100 pounds of milk testing 3.5 per cent butterfat. This is the same level as that in effect during the previous 12 months.

The support price on butter will continue at 65 cents a pound for butter grading 40 score.

The support price on spray processed skim milk powder will remain at the present level of 20 cents a pound for powder meeting Canadian Dairy Commission quality specifications.

The support price on white cheddar cheese manufactured in April, 1969, was set at 44 cents a pound. The support price on cheese made on and after May 1 will be announced later.

To supplement the market value and provide the \$4.85 support level, the rate of direct subsidy for manufacturing milk will be \$1.25 per 100 pounds of milk or 35.71 cents per pound of butterfat.

To finance the cost of surplus disposal, the Dairy Commission will hold back from subsidy payments an average of 29 cents per 100 pounds on milk deliveries. There will be a differential rate of holdback on deliveries up to quota and on those in excess of quota. For deliveries up to quota the rate will be 26 cents per 100 pounds of milk (7.43 cents per 100 pounds butterfat). On deliveries in excess of quota

the rate will be 52 cents per 100 pounds of milk (14.86 cents per pound butterfat).

The rate of holdback from cream shippers will remain unchanged at 1 cent per pound of butterfat. The rate of holdback on both milk and cream will be subject to adjustment if butterfat supplies increase. (March 31, 1969)

Wool Deficiency Payment — The deficiency payment on eligible grades of wool from the 1968-69 wool clip will be 29.4 cents a pound. The deficiency payment represents the difference between the support price of 60 cents a pound and the national average market price received by producers for eligible wool marketed during 1968-69.

Payments will be made to some 17,000 producers and will total about \$900,000. To qualify, a producer must have marketed at least 20 pounds of wool of the eligible grades through a registered wool warehouse. (April 1, 1969)

Interim Payment for Pea-beans and Yellow-eye beans — By Order in Council, the Ontario Bean Producers Marketing Board received authority to make interim payments to primary producers for beans produced in Ontario during 1968. The payments to be in the amount of \$2 per 100 pounds for pea-beans and \$1 per 100 pounds for yellow-eye beans. (April 15, 1969)

Potato Price Stabilization Order, 1968 — By Order in Council, the Agricultural Stabilization Board was authorized to stabilize the price of potatoes delivered from the 1968 crop to starch factories in the Province of New Brunswick. Payments to producers for potatoes delivered between March 17 and May 1, 1969 will be \$1.45 per barrel, and for potatoes delivered on or after May 1, 1969, \$1.50 per barrel. Payment shall be limited to deliveries up to but not in excess of 1,000 barrels per producer. The program is aimed at stabilizing prices to potato growers in the Atlantic region, but only those farmers in the vicinity of the starch plants in the Province of New Brunswick will be participating directly. (April 15, 1969)

Credit for Indian Farmers — Amendments to the Farm Credit Act permit the Farm Credit Corporation to accept applications for long-term mortgage loans from Indians farming on reserves. (May 1, 1969)

FACTORS AFFECTING THE PRODUCTION OF TOMATOES FOR PROCESSING

J. L. Pando

The tomato is second to the potato as the most important vegetable crop in Canada. Tomato acreage represents 13 per cent of the total area devoted to vegetables and the farm value of production is more than 25 per cent of the total for all vegetables. Ontario, Quebec and British Columbia have the main tomato growing areas. Ontario produces about 93 per cent of the total Canadian production (Table 1).

The area planted to tomatoes decreased in size between 1949 and 1966, but total production increased because increases in yields per acre offset the reduction in acreage. The area used for processing tomatoes is about 80 per cent of the total acreage of tomatoes. Although the gross returns per acre are generally lower for processing tomatoes than for fresh tomatoes, yields per acre are higher and the costs of production and marketing are lower.

The consumption of processed tomatoes is almost three times the consumption of fresh tomatoes. Exports of processed tomatoes, especially in the form of tomato juice, have been growing in importance. During the last five years, tomato juice has been one of the few products of the vegetable industry that has shown a positive balance of trade.

To facilitate the analysis of the factors affecting the production of tomatoes for processing, this study is

divided into two parts. The first part considers the factors affecting supply or the decision-making processes of growers. The second part examines the problem from the opposite viewpoint and considers the factors affecting the decision-making processes of tomato canners.

FACTORS AFFECTING SUPPLY

The geographical expansion of the industry is determined, primarily, by physical limiting factors. Tomatoes are especially demanding of soils and climate (1).

Among the economic factors having the greatest influence on supply are cost of production, distance and transportation facilities from the farm to the processing plants, and the conditions laid down in producer-processor contracts.

The cost of production is the most important economic factor determining the pattern of development for this industry. According to a study by the Ontario Department of Agriculture and Food, tomatoes for processing is one of the crops with the highest measurable cost per acre (2). The most important cost item is labor which represents 49 per cent of the total cost of production; 69 per cent of the labor is used in

TABLE 1—ACREAGE, PRODUCTION AND YIELD OF TOMATOES FOR PROCESSING, CANADA BY REGION, 1953 TO 1967

Year	Canada			Quebec			Ontario			British Columbia		
	Acreage	Yield	Production	Acreage	Yield	Production	Acreage	Yield	Production	Acreage	Yield	Production
	acres	pounds per acre	thousand pounds	acres	pounds per acre	thousand pounds	acres	pounds per acre	thousand pounds	acres	pounds per acre	thousand pounds
1957 . . .	43,010	11,400	500,977	6,230	11,000	77,767	33,822	11,200	391,504	1,910	19,600	31,706
1958 . . .	39,700	17,100	680,745	5,770	5,700	32,956	32,203	19,200	629,227	1,230	19,400	18,562
1959 . . .	n.a.	n.a.	603,804	4,500	9,400	42,497	25,528	21,800	552,954	n.a.	n.a.	8,353
1960 . . .	n.a.	n.a.	n.a.	3,500	12,507	43,776	24,658	27,216	671,178	n.a.	n.a.	n.a.
1961 . . .	n.a.	n.a.	n.a.	3,800	11,724	44,552	19,757	21,018	581,212	n.a.	n.a.	n.a.
1962 . . .	24,873	29,300	728,788	2,800	8,400	23,580	20,761	32,700	695,844	793 ^a	11,808 ^a	9,364
1963 . . .	n.a.	n.a.	575,177	1,610	4,600	7,416	20,360	27,500	560,660	n.a.	n.a.	7,101
1964 . . .	n.a.	n.a.	650,636	1,250	9,100	11,350	23,413	30,200	636,948	n.a.	n.a.	2,338
1965 . . .	22,390	34,900	782,137	1,100	7,400	8,124	24,380	37,000	768,564	510	10,700	5,449
1966 . . .	21,860	26,142	571,460	940	10,880	10,180	20,013	26,950	554,640	340	19,529	6,640
1967 . . .	23,730	27,917	662,460	1,010	11,743	11,860	23,394	28,912	641,260	540	17,296	9,340

n.a. = not available.

^a Estimate.

Source: *Acreage, Production and Farm Value of Commercial Vegetables*, Cat. No. 22-003, Seasonal, Dominion Bureau of Statistics.

harvesting operations. These high labor costs have played a major role in developing the present structure of the industry. It is comprised of a small number of highly specialized growers with large enterprises. In the study by the Ontario Department of Agriculture and Food, the results infer that an average size of enterprise of approximately 10 acres permits the optimum use of new cultural techniques and management. However, the high labor costs and the growing shortage of pickers threaten the industry's expansion. The area planted to tomatoes has been decreasing steadily and this trend is expected to continue.

A further factor affecting the supply of tomatoes is the distance from the farm to the processing plants. In Quebec, Ontario and British Columbia, the crop is grown in districts with good transportation facilities and close to the processing plants. In Ontario, 72 per cent of the provincial acreage is located in the counties of Essex and Kent. Since 1945, a clear shift of production has occurred from Central and Eastern Ontario to the Southwestern part of the province. Production in Quebec is concentrated in the counties of Rouville, Iberville and St. Hyacinthe where the bulk of the canning factories are located. A survey of 288 growers in Quebec showed 51 per cent were located within 5 miles of the plant or assembly point and 71 per cent within 10 miles (3).

The other important factor affecting production is the conditions of the contract between the growers and the canners. One of the stipulations of this contract is the price that the canners will pay for a ton of tomatoes. In Ontario, tomatoes after harvesting are graded into Ontario No. 1 and No. 2 grades. No. 1 tomatoes receive the highest price and No. 2 a price which is approximately 70 per cent of the No. 1 price. Prices increased from \$27.60 per ton in 1949 to \$50 per ton in 1967 for No. 1 tomatoes and from \$17.60 to \$38 for No. 2. If this trend is expressed in constant dollars, very slight variations have occurred (Table 2). Therefore, it is assumed that since the production of processing tomatoes has increased the supply is very elastic.

Another factor in the contract between grower and canner is the stipulated acreage. Every year the processors contract a specific number of acres (Table 3). They also stipulate a tonnage limitation per acre (4). The tonnage limitations for the 1968 crop were as follows: 18.5 tons per acre in Western Ontario, 16.5 tons per acre in Central Ontario and 14 tons per acre in Eastern Ontario. An average yield per acre of 18.5 tons was obtained in 1965. When a grower produces in excess of the stipulated tonnage per acre the surplus may be diverted to the fresh market, used to satisfy demand from the processing plants not met by other growers, or wasted.

TABLE 2—PRICES TO GROWERS FOR TOMATOES FOR PROCESSING, ONTARIO, 1949 TO 1967

Year	Ontario No. 1		Ontario No. 2	
	current dollars per ton		constant dollars per ton	
1949	27.60	17.60	12.07	7.70
1950	26.85	16.85	11.34	7.12
1951	32.00	22.00	11.91	8.19
1952	40.00	30.00	15.98	11.99
1953	38.00	28.00	17.15	12.64
1949-53	32.89	22.89	13.69	9.53
1954	36.50	23.50	17.09	11.00
1955	37.00	24.00	17.40	11.29
1956	37.00	25.00	17.27	11.67
1957	41.50	25.50	19.42	11.94
1958	41.50	25.50	18.62	11.44
1954-58	38.70	24.70	17.96	11.47
1959	41.50	25.50	18.53	11.39
1960	41.50	25.50	18.31	11.25
1961	41.50	25.50	17.97	11.04
1962	41.50	25.50	17.23	10.59
1963	41.50	25.50	17.56	10.79
1959-63	41.50	25.50	17.92	11.01
1964	41.50	25.50	17.83	10.96
1965	45.00	29.00	18.01	11.61
1966	48.95	32.95	18.43	12.40
1967	50.00	38.00	19.08	14.50
1964-67	46.36	31.36	18.34	12.37

Sources: (1) The Farm Products Marketing Board of Ontario, Toronto, Ontario.
(2) Ontario Vegetable Growers' Marketing Board, Hamilton, Ontario.

TABLE 3—CONTRACTED ACREAGE OF TOMATOES FOR PROCESSING, CANADA, 1943 TO 1968

Year	Quebec		Ontario		British Columbia		Canada
	acres	per cent	acres	per cent	acres	per cent	
1949	6,140	15.6	29,420	75.0	3,680	9.4	39,240
1950	3,100	10.6	23,650	81.1	2,430	8.3	29,180
1951	5,280	12.5	34,300	81.4	2,580	6.1	42,160
1952	5,820	13.7	33,730	79.1	3,080	7.2	42,630
1953	5,030	16.2	23,300	75.3	2,620	8.5	30,950
1954	5,260	17.8	22,300	75.4	2,020	6.8	29,580
1955	6,250	17.3	28,070	77.8	1,750	4.9	36,070
1956	7,420	18.2	31,500	77.5	1,740	4.3	40,660
1957	7,160	16.2	35,240	79.8	1,780	4.0	44,180
1958	5,860	14.8	32,800	82.7	990	2.5	39,650
1959	4,060	12.9	26,720	84.6	780	2.5	31,560
1960	3,500	12.1	24,800	85.8	620	2.1	28,920
1961	3,800	14.6	21,490	82.5	760	2.9	26,050
1962	2,800	11.2	21,430	85.5	840	3.3	25,070
1963	1,610	7.4	20,290	92.6	n.a.	—	21,900
1964	1,460	6.3	21,640	93.7	n.a.	—	23,100
1965	1,100	4.9	20,780	92.8	510	2.3	22,390
1966	950	4.1	21,900	94.3	380	1.6	23,230
1967	1,030	4.3	22,360	93.4	540	2.3	23,930
1968	1,610	7.0	20,970	90.6	560	2.4	23,140

n.a. = not available.

Sources: (1) *Contracted Acreage of Canning Crops*, Cat. No. 22-003, Seasonal, Dominion Bureau of Statistics.
 (2) Ontario Vegetable Growers' Marketing Board, Hamilton, Ontario.

FACTORS AFFECTING DEMAND

Of the products derived from processing tomatoes, tomato juice is the most important. Its production has increased since 1948 (Table 4). Ranking second in importance is canned tomatoes, the production of which has changed little since 1948. The production of ketchup has had the greatest relative expansion. The production of pulp, paste and puree has been declining steadily and is now of little importance to

Canadian producers. These products are mostly imported from the United States and Italy.

Trade in tomato juice shows an expansive trend in both the domestic and foreign markets. Exports have increased from about 2 million pounds in 1948 to 13.7 million pounds in 1967 (Table 5). The largest export market for this product is the United Kingdom. If the U.K. joins the European Economic Community, this market for tomato juice will undoubtedly be lost.

TABLE 4—PRODUCTION OF PROCESSED TOMATO PRODUCTS, BY TYPE, CANADA, 1948 TO 1967

Year	Tomato Juice	Canned Tomatoes	Tomato Pulp, Paste and Puree	Ketchup
thousand pounds				
1948	184,416	140,300	38,510	49,488
1949	88,871	80,251	7,806	17,831
1950	72,339	48,312	n.a.	n.a.
1951	119,272	65,366	19,235	38,074
1952	155,105	126,581	15,287	32,929
1953	105,678	87,288	6,071	25,393
1954	95,453	43,531	10,490	32,024
1955	139,110	85,960	8,746	32,189
1956	121,543	86,975	6,145	36,676
1957	137,472	76,601	6,104	42,271
1958	171,789	76,786	5,280	51,338
1959	164,924	78,654	3,713	33,828
1960	182,446	115,910	7,156	57,479
1961	197,751	89,670	6,386	37,862
1962	224,929	105,356	3,110	52,567
1963	173,777	81,254	2,242	61,175
1964	209,893	83,029	n.a.	61,180
1965	227,477	101,381	n.a.	76,924
1966	148,573	93,186	n.a.	78,398
1967	227,179	99,321	3,805	77,594

Source: *Pack of Canned and Frozen Processed Foods*, Cat. No. 32-212, Annual, Dominion Bureau of Statistics.

Imports of canned tomatoes have increased from 2 million pounds in 1948 to 27 million pounds in 1966. This trend contrasts sharply with the almost stable domestic production of this commodity, which means that increased domestic requirements have been filled by imports.

Since canned tomatoes and tomato juice are the main outputs of the tomato processing industry the present analysis will consider them alone. Because

it was thought that the major factors affecting demand by canners and, in turn, the contracts entered into with growers, are the level of stock together with the disappearance of processed tomato products in the previous year, the first step in the analysis was to correlate the demand for tomatoes by the canners with the disappearance and stocks of canned tomatoes and tomato juice respectively (5). The data used were those in tables 5, 6 and 7.

TABLE 5—EXPORTS AND IMPORTS OF PROCESSED TOMATO PRODUCTS, 1948 TO 1967

Year	Purchases by Processors	Canned tomatoes			Tomato juice		
		Exports	Imports	Net Trade	Exports	Imports	Net Trade
		thousand pounds					
1948	882,554	866	2,076	-1,210	1,943	—	1,943
1949	427,501	292	88	204	788	—	788
1950	365,099	7,516	868	6,648	1,073	—	1,073
1951	581,623	2,490	12,178	-9,688	1,550	—	1,550
1952	696,827	132	27,532	-27,400	1,056	—	1,056
1953	500,556	152	8,088	-7,936	1,733	—	1,733
1954	433,201	310	7,566	-7,256	1,801	20,711	-18,910
1955	557,376	220	14,654	-14,434	2,197	25,288	-23,091
1956	514,039	84	26,524	-26,440	2,475	26,885	-24,410
1957	548,064	50	21,902	-21,852	1,228	48,848	-47,620
1958	682,024	154	16,462	-16,308	1,558	28,234	-26,676
1959	596,081	56	20,280	-20,224	3,629	19,540	-15,911
1960	726,106	70	22,844	-22,774	5,114	14,455	-9,341
1961	634,674	196	18,946	-18,750	10,114	12,308	-2,194
1962	728,516	284	8,964	-8,680	11,612	7,099	4,513
1963	575,776	—	13,064	-13,064	13,387	11,988	1,399
1964	653,896	—	24,648	-24,638	13,387	18,123	-4,736
1965	778,452	—	33,256	-33,258	19,625	9,806	9,819
1966	603,510	—	27,086	-27,086	14,950	8,027	6,923
1967	—	—	—	—	13,756	6,071	7,685

Sources: (1) *Crop and Seasonal Price Summaries*, Canada Department of Agriculture.

(2) *Trade of Canada*, Cat. No. 65-007, Dominion Bureau of Statistics.

TABLE 6—CANNED TOMATOES, PRODUCTION, STOCKS AND DISAPPEARANCE, CANADA, 1948 TO 1966

Year	Volume produced	Carry-over stocks	Stocks at December 31	Disappearance
thousand pounds				
1948	140,300	31,211	84,397	87,114
1949	80,251	84,397	100,514	64,134
1950	48,312	100,514	46,848	101,978
1951	65,366	46,848	23,672	88,542
1952	126,581	23,672	85,180	65,073
1948-52	92,162	57,328	68,122	81,368
1953	87,288	85,180	90,177	82,291
1954	43,531	90,177	38,392	95,316
1955	85,960	38,392	47,827	76,525
1956	86,975	47,827	57,443	77,359
1957	76,601	57,443	58,528	75,516
1953-57	76,071	63,804	58,473	81,402
1958	76,786	58,528	52,083	83,231
1959	78,654	52,083	51,828	78,909
1960	115,910	51,828	86,890	80,848
1961	89,670	86,890	71,045	105,515
1962	105,356	71,045	76,694	99,707
1958-62	93,275	64,075	67,708	89,642
1963	81,254	76,694	47,519	110,429
1964	83,029	47,519	43,121	87,427
1965	101,381	43,121	60,572	83,930
1966	93,186	60,572	70,725	83,033
1963-66	89,712	56,977	55,484	91,205

Sources: (1) *Pack of Canned and Frozen Processed Foods*, Cat. No. 32-212, Annual, Dominion Bureau of Statistics.

(2) *Stocks of Canned Foods*, Cat. No. 32-011, Dominion Bureau of Statistics.

TABLE 7—TOMATO JUICE PRODUCTION, STOCKS, AND DISAPPEARANCE, CANADA, 1948 TO 1966

Year	Volume produced	Carry-over stocks	Stocks at December 31	Disappearance
thousand pounds				
1948	184,416	47,620	124,082	107,954
1949	88,871	124,082	95,406	117,547
1950	72,339	95,406	54,829	112,916
1951	119,272	54,829	64,860	109,241
1952	155,105	64,860	128,698	91,267
1948-52	124,001	77,359	93,575	107,785
1953	105,678	128,698	109,540	124,836
1954	95,453	109,540	74,390	130,603
1955	139,110	74,390	90,713	122,787
1956	121,543	90,713	75,171	137,085
1957	137,472	75,171	100,418	112,225
1953-57	119,851	95,702	90,046	125,507
1958	171,789	100,418	137,402	134,805
1959	164,924	137,402	139,351	162,975
1960	182,446	139,351	152,239	169,558
1961	197,751	152,239	166,030	183,960
1962	224,929	166,030	173,722	217,237
1958-62	188,368	139,088	153,749	173,707
1963	173,777	173,722	131,567	215,932
1964	209,893	131,567	156,666	184,794
1965	227,477	156,666	187,951	196,192
1966	148,573	187,951	134,415	202,109
1963-66	189,930	162,477	152,650	199,757

Sources: (1) *Pack of Canned and Frozen Processed Foods*, Cat. No. 32-212, Annual, Dominion Bureau of Statistics.

(2) *Stocks of Canned Foods*, Cat. No. 32-011, Dominion Bureau of Statistics.

The analysis shows that the disappearance of tomato juice had the strongest influence on the variations in demand. Since 1948 the trend in disappearance of tomato juice followed very closely the trend in purchases of tomatoes by the canners. For canned tomatoes no clear trend was found.

When the purchases of tomatoes were related to disappearance and stocks of canned tomatoes it was found that disappearance had no substantial influence on the variations in demand, but the level of stocks had a considerable influence on canners' decisions. The results are the opposite with disappearance and stocks of tomato juice. Disappearance had a considerable influence on the demand for tomatoes for processing while the impact of stocks was very small.

The explanation of these disparate results is based on the different trends of these two commodities. Since disappearance of canned tomatoes from domestic production is relatively constant this factor does not represent a major influence in the decisions made by the canners regarding changes in acreage and tonnage contracted. Stocks of this product, on the contrary are a major concern for the canner in view of the limited demand from the domestic market. Any increase in inventories represents an increase in risk and uncertainty since no extra domestic demand or increase in exports can be expected.

Variations in disappearance of tomato juice represent the strongest factor affecting changes in its demand. Almost all exports of tomato juice go to the United Kingdom, an uncertain future market. Changes in consumption on the domestic market may represent changes in consumer preference and possibly variation in demand during the next year. Tomato juice cannot be stored longer than one year. This is one of the reasons why the stock factor has limited effect on decision-making by the makers of tomato juice.

Thus, the main factors affecting the volume of tomatoes purchased by the canners are the disappearance of tomato juice and the volume of stocks of canned tomatoes. These factors operate in opposite directions and thus while an increase in the disappearance of tomato juice encourages the demand for tomatoes by the canners, an increase in stocks of canned tomatoes reduces this demand.

The next step in the analysis was to quantify the weight that each factor had in the decision-making process of the canners. This was obtained by using a homogeneous function where both factors are correlated with the volume of tomatoes sold to processors. This is undoubtedly a great over-simplification since we are assuming that the canners consider these two factors only in making their plans for

contracting in subsequent years. In fact there are many factors involved which may affect the canners' decisions. However, for the sake of simplicity and for purposes of illustrating the relative importance of each of these two factors on decision-making by the canners when contracts are negotiated the homogeneous function was used (6).

Analysis shows that an increase of 10 per cent in the disappearance of tomato juice produces an increase of 3.8 per cent in the quantity of processing tomatoes demanded by the canners in the following year. An increase of 10 per cent in the stocks of canned tomatoes results in a decrease of 3.2 per cent in the volume of tomatoes demanded in the following year. Since the two factors operate in opposite directions, it is possible to estimate the total effect produced by both factors changing at the same time. For example, an increase of 10 per cent in each one of the two factors would produce a combined effect on the volume demanded in the following year equal to an increase of 0.6 per cent. If each factor varies in the same percentage but in opposite directions, the combined effect would be the sum of the exponents of the factors. For example, an increase of 10 per cent in stocks of canned tomatoes accompanied by a decrease of 10 per cent in the disappearance of tomato juice would result in a decrease of 7 per cent in the volume of tomatoes for processing demanded in the following year.

When no changes occur in either of the two factors the canners would demand, at least, a volume of tomatoes for processing equal to 205.6 million pounds.

POSSIBLE FUTURE TRENDS

The contracting procedures between canners and growers for tomatoes for processing are expected to continue. By 1980, southwestern Ontario will probably be the only producing region in Canada. The unfavorable climate for tomatoes in Quebec may cause canners in that province to seek their supplies in Ontario. In British Columbia where the industry is of marginal importance, the area planted to tomatoes may be used by less labor-intensive crops.

Developments in international markets will adversely affect the Canadian industry. In the United States, harvesting operations are rapidly becoming mechanized (7). The relatively small scale of the industry in Canada, both at the individual farm level and at the overall national level, and the limitations and uncertainty of the market for Canadian processed tomatoes, are not conducive to rapid large-scale investment in mechanization. Therefore, imports of processed tomatoes from the United States

will likely continue to increase with a parallel reduction in production in Canada.

The main export market for tomatoes will likely be lost if the United Kingdom joins the European Economic Community (8).

Per capita consumption of processed tomatoes will increase slightly. Consumption in 1980 is expected to be 52 pounds per capita compared with about 50 pounds in 1964. The change in the structure of the population may affect the pattern of consumption of processed tomatoes. In 1966, 28.8 per cent of Canada's population was between 15 and 34 years of age and it is expected that in 1980, 35 per cent of the population will be in that age group (9). This will probably result in an increase in consumption of ketchup, chili sauce and tomato paste. These are largely imported commodities and any increase in demand will likely continue to be met by imports.

SUMMARY AND CONCLUSIONS

Physical factors impose a limit on the area planted to tomatoes for processing in Canada. Labor costs, location and transportation facilities are among the main economic factors that restrict the area planted. Southwestern Ontario is the most efficient area of Canada for producing tomatoes for processing.

The demand for processing tomatoes has been largely determined by growth in the domestic and export markets for tomato juice. This growth and the level of stocks of canned tomatoes have been the main factors influencing the volume of tomatoes placed under contract by the canners each year.

Increasing labor costs and unfavorable developments in the international market for Canadian processed tomatoes will cause further reductions in the acreage of tomatoes for processing and in the production of processed tomatoes. The sales of processed tomatoes will be restricted to the domestic market which, in turn, will face strong competition from abroad.

Both growers and canners will reduce their output. Increasing labor costs will induce the growers to substitute less labor demanding crops for tomatoes. The increasing competition from abroad and the high cost of the raw material will force the canners to limit their production to the tomato juice and canned tomato markets of Canada.

NOTES AND REFERENCES

- (1) R. E. Neild and J. O. Young, "Agroclimatological Procedure for Determining and Evaluating Time and Length of Harvest Season for Processing Tomatoes", *Proceedings of the American Society for Horticultural Science*, Vol. 89, December 1966.

(2) G. A. Fisher, *Processing Tomatoes in Ontario*, Farm Economics, Co-operatives and Statistics Branch, Ontario Department of Agriculture and Food, Toronto, September 1966.

(3) G. T. Girard, *Tomatoes for Processing*, Economics Division, Canada Department of Agriculture, Ottawa, Pub. No. 64/5, April 1964.

(4) *Can Crop News Letter*, Report No. 8-1, Ontario Vegetable Growers' Marketing Board, Hamilton, April 1968.

(5) The correlation equations are as follows:

Canned tomatoes

$$Q_t = 61335 + 1.814 D_c(t-1) - 2.883 S_c(t-1)$$

(1.889) (1.157)

$$R^2 = 0.643$$

Tomato juice

$$Q_t = 388697 + 1.6505 D_j(t-1) - 0.3462 S_j(t-1)$$

(0.9216) (0.7317)

$$R^2 = 0.499$$

Where Q_t = volume of tomatoes sold to processors

$D_c(t-1)$ = disappearance of canned tomatoes in previous year

$D_j(t-1)$ = disappearance of tomato juice in previous year

$S_c(t-1)$ = stocks of canned tomatoes in previous year

$S_j(t-1)$ = stocks of tomato juice in previous year

The data used for this analysis correspond to the time period 1948-66. In the first equation stocks of canned tomatoes is the most important variable affecting the purchases of tomatoes by the canners. This variable is perhaps the most important of the whole system and that being most carefully considered by the canners at the moment of planning their contracts. In the second equation, disappearance of tomato juice is the most important variable affecting the purchases of tomatoes by the canners.

This variable, however, does not seem to concern the canners as much as the volume of stocks of canned tomatoes.

(6) The function obtained was as follows:

$$Q = 205,600 D_j^{0.3846}(t-1) S_c^{-0.3214}(t-1)$$

Where Q = volume of tomatoes purchased by the canners

$D_j(t-1)$ = disappearance of tomato juice in previous year

$S_c(t-1)$ = stocks of canned tomatoes in previous year

If all other factors affecting the volume of tomatoes purchased by the canners are assumed to be constant, the function means that the quantity purchased is equal to a constant amount (205,600) times the disappearance of tomato juice in the previous year raised to the power of 0.3846 and times the stocks of canned tomatoes in the previous year raised to the power of -0.3214. Since the data used were expressed in thousand pounds the results will be in thousand pounds.

(7) *Production, Consumption and Foreign Trade of Fruit and Vegetables in OECD Member Countries*, "Tomatoes", p. 16, Organization for Economic Co-operation and Development, Paris, 1968.

(8) "Some Implications of An Enlarged European Economic Community for Canadian Agriculture", paper prepared for presentation to the Eastern Ontario Branch of the Agricultural Institute of Canada, September 1967, by S. C. Hudson, G. J. Dobson, G. A. Hiscocks, E. W. Stewart and J. S. Lohoar, Economics Branch, Canada Department of Agriculture, Ottawa.

(9) W. M. Illing, *Population, Family, Household and Labor Force Growth to 1980*, pp. 28, 40 and 41, Staff Study No. 19, Economic Council of Canada, Queen's Printer, Ottawa, September 1967.

SOME MARKETING HABITS OF PRAIRIE GRAIN PRODUCERS

D. Zasada

Information about the marketing habits of grain producers in the Prairie Provinces was obtained by means of a questionnaire, distributed by elevator companies through their country agents, to farmers in 1966-67. The questionnaire was developed by the Geographical Branch of the Department of Energy, Mines and Resources. The returned questionnaires were analyzed by the Economics Branch of the Department of Agriculture.

This article deals with two of the questions that were included in the questionnaire:

1. Why do you deliver to this particular point (referring to the delivery point that the producer selected and reported on his Wheat Board permit)?
2. How much money do you spend at your grain delivery point each year?

To question 1, producers were asked to reply either "yes" or "no" to the following reasons: (i) best road access, (ii) preference for elevator company,

(iii) shortest hauling distance, (iv) good shopping facilities, (v) banking, business, etc. (vi) other reasons.

To question 2, the respondents were asked to report the amount of money spent on each of the following at their delivery point: (i) groceries and household supplies, (ii) farm supplies, (iii) farm machinery.

RESPONSE TO THE QUESTIONNAIRE

About 15,000 farmers responded to the questionnaire, about 8 per cent of the grain farmers as reported by Canadian Wheat Board permits for the crop year 1966-67. The response rate differed substantially by province. Saskatchewan had the greatest response with 10.6 per cent, followed by Alberta at 6.0 per cent, and Manitoba with only 3.9 per cent response. Response results by province and by size of farm are shown in Table 1.

TABLE 1—RESPONSE TO QUESTIONNAIRE, BY PROVINCE AND BY SIZE OF FARM

Size of farm	Manitoba		Saskatchewan		Alberta		Totals	
	number	per cent	number	per cent	number	per cent	number	per cent
acres								
Less than 160.....	183	13	802	9	612	15	1,597	10
161- 320.....	324	23	1,485	15	847	21	2,656	17
321- 640.....	540	39	3,365	34	1,223	30	5,128	33
641- 960.....	241	17	2,119	21	632	16	2,992	20
961-1,280.....	74	5	1,061	11	326	8	1,461	10
More than 1,280.....	37	3	999	10	404	10	1,440	10
Totals.....	1,399	100	9,831	100	4,044	100	15,274	100

TABLE 2—NUMBER OF GRAIN FARMS AS REPORTED BY CANADIAN WHEAT BOARD PERMITS, BY PROVINCE AND BY SIZE OF FARM, 1966-1967

Size of farm	Manitoba		Saskatchewan		Alberta		Totals	
	number	per cent	number	per cent	number	per cent	number	per cent
acres								
Less than 160.....	7,819	22	11,821	13	13,187	20	32,827	17
161- 320.....	10,924	30	19,986	22	18,903	28	49,813	25
321- 640.....	12,219	34	32,126	35	20,404	30	64,749	33
641- 960.....	3,543	9	16,095	17	8,034	12	27,672	14
961-1,280.....	1,054	3	6,796	7	3,453	5	11,303	6
More than 1,280.....	597	2	5,434	6	3,428	5	9,459	5
Totals.....	36,156	100	92,258	100	67,409	100	195,823	100

TABLE 3—PROPORTION OF FARMERS DELIVERING TO EACH SIZE OF DELIVERY POINT

Size of delivery point	Per cent of farmers
number of persons	
Less than 200.....	55
201- 400.....	18
401- 600.....	11
601- 800.....	5
801-1,000.....	3
More than 1,000.....	8
Total.....	100

In comparison with the population of grain farms in the Prairie Provinces (Table 2), the response to the questionnaire is biased towards larger farms (more than 640 acres in size). The bias exists within each of the provinces and is probably the result of the large difference in the number of small and large farms. Canadian Wheat Board permits show only 25 per cent of the grain farms as being larger than 640 acres, while the survey shows 40 per cent are larger. For the purpose of reporting results of the survey the producers were considered as a homogeneous group between provinces and the replies are presented for the prairies as an entity, rather than by province.

The responses to the questionnaire were stratified or grouped according to the size of farm and to the size of the delivery point. The delivery point sizes were determined by the number of persons at that point. Population was considered to be an indicator of services available. One would expect more facilities, and more diverse facilities at a point whose population was 1,000 persons than at one where there were only 50 people.

About 55 per cent of the producers delivered to a point with population of 200 or fewer persons (Table 3). Eight per cent delivered to points with a population of more than 1,000 persons.

Question 1: Why Do You Deliver Grain To This Particular Point? (Table 4)

(i) *Best Road Access* — For the respondents as a whole, 53 per cent replied that they delivered to their point because of best road access. The proportion of “yes” responses does not vary greatly by either size of farm or size of delivery point. The exception to this appears to be in the 601 - 800 persons size of delivery point where the proportions are generally the highest of any farm size group. (In parts ii to vi the same result generally applies). It is difficult to imagine why the exception occurs other than it is an oddity in the data and probably should be discounted to conform to the overall general trend.

(ii) *Preference for Elevator Company* — About 54

per cent of all respondents delivered to their point because of a preference for the elevator company. The response rate does not vary significantly with either the size of farm or the size of the delivery point, except for the 601-800 persons delivery point group where the “yes” response is highest of any farm size group.

(iii) *Shortest Hauling Distance* — About 80 per cent of the respondents delivered to their particular delivery point because of shortest hauling distance. If one discounts the 601-800 persons size of delivery point there is a lessening importance of shortest hauling distance as the size of the delivery point increases. The reason for this might well be that some producers by-pass a small delivery point (one with limited service activities) if a larger point necessitates only a few hauling miles. There is little variation in the proportion of “yes” responses by size of farm.

(iv) *Good Shopping Facilities* — Only 28 per cent of the respondents felt that good shopping facilities was a factor in selecting a grain delivery point. There is a very definite variation in the response rate by the size of the delivery point. Again, discounting the response of the 601-800 persons size of delivery point, there is an increasing proportion of “yes” responses as the size of the delivery point increases. Generally, the response is independent of the size of farm. One exception is the smallest farm size (less than 160 acres), where the proportion of “yes” responses is several percentage points lower, in the middle delivery point size groups, than is the average for those delivery point size groups.

(v) *Banking, Business, etc.* — Only 25 per cent of the respondents felt that “banking, business, etc.”, was a factor in selecting a grain delivery point. As for “good shopping facilities” there is a definite variation in the response rate by the size of the delivery point. Outside of the delivery size group 601-800 persons there is an increasing “yes” response rate as the size of delivery point increases. Generally the response rate of “yes” answers is independent of the size of farm, although one can detect a slightly lower “yes” response from the smallest farm size in the middle size of delivery point groups.

In both parts iv and v it should be noted that the proportion of “yes” responses is substantially lower in the smallest delivery point size group than in the others. This indicates the limited facilities for shopping, banking, etc., that exist in these small centers.

(vi) *Other reasons* — “Other reasons” for choosing a delivery point appear to be insignificant. It is likely that some “other reasons” are compounded in the other possibilities. For example, preference for an elevator agent would probably be included in the section “preference for the elevator company”.

TABLE 4— REASONS FOR DELIVERING GRAIN TO DELIVERY POINT, BY SIZE OF FARM AND BY SIZE OF DELIVERY POINT

Size of farm	Population of Delivery Point						All delivery points
	Less than 200	200-400	401-600	601-800	801-1,000	More than 1,000	
acres							
(i) Best Road Access							
Less than 160.....	44	53	47	48	49	56	49
161- 320.....	46	54	54	85	59	51	52
321- 640.....	50	56	58	78	59	59	54
641- 960.....	50	61	62	79	55	64	56
961- 1,280.....	50	58	66	79	59	60	55
More than 1,280.....	48	55	60	77	59	65	52
All Farms.....	49	56	58	76	57	59	53
(ii) Preference for Elevator Company							
Less than 160.....	54	49	46	78	54	62	53
161- 320.....	53	54	49	75	53	64	55
321- 640.....	53	51	56	70	44	58	54
641- 960.....	52	53	62	68	39	62	54
961- 1,280.....	52	53	54	75	53	65	54
More than 1,280.....	52	54	68	66	46	57	55
All Farms.....	53	52	56	72	46	61	54
(iii) Shortest Hauling Distance							
Less than 160.....	81	79	78	58	89	72	79
161- 320.....	82	77	76	85	77	70	80
321- 640.....	82	80	79	85	76	76	81
641- 960.....	83	80	76	82	73	67	81
961- 1,280.....	82	77	75	89	65	75	80
More than 1,280.....	84	78	78	83	73	68	81
All Farms.....	82	79	77	81	75	72	80
(iv) Good Shopping Facilities							
Less than 160.....	10	32	36	37	49	66	22
161- 320.....	11	31	45	69	49	70	27
321- 640.....	11	37	50	78	52	67	29
641- 960.....	10	41	56	77	51	67	29
961- 1,280.....	11	36	41	83	71	62	26
More than 1,280.....	9	37	53	85	54	60	27
All Farms.....	11	36	48	72	53	67	28
(v) Banking, Business, etc.							
Less than 160.....	5	29	43	36	40	58	19
161- 320.....	5	30	47	66	46	64	24
321- 640.....	6	36	54	73	57	62	26
641- 960.....	6	41	56	74	56	62	26
961- 1,280.....	6	41	43	85	59	56	24
More than 1,280.....	4	39	52	79	54	56	23
All Farms.....	5	36	51	69	53	61	25
(vi) Other Reasons							
Less than 160.....	1	4	4	0	6	4	2
161- 320.....	3	3	3	6	3	3	3
321- 640.....	3	2	2	3	7	6	3
641- 960.....	3	2	1	3	6	6	3
961- 1,280.....	4	4	1	2	11	2	4
More than 1,280.....	3	2	3	4	3	9	4
All Farms.....	3	3	2	3	7	5	3

Question 2: How Much Money Do You Spend At Your Grain Delivery Point Each Year? (Table 5)

(i) *On Groceries and Household Supplies* — About 47 per cent of the respondents spent more than \$500 per year, on groceries and household supplies, at their grain delivery point. The response rate differs substantially by size of farm and by size of delivery

point. By size of farm, regardless of the delivery point size, it varies from a low of 33 per cent for the smallest size of farms to a high of 58 per cent for the largest size of farms. By size of delivery point, regardless of farm size, it varies from a low of 30 per cent for smallest delivery points to a high of 81 per cent in the 601-800 persons size of delivery point.

TABLE 5—PROPORTION OF FARMERS SPENDING MORE THAN \$500 A YEAR AT DELIVERY POINT, ON EACH OF GROCERIES AND HOUSEHOLD SUPPLIES, ON FARM SUPPLIES, AND ON FARM MACHINERY, BY SIZE OF FARM AND BY SIZE OF DELIVERY POINT

Size of farm	Population of Delivery Point						All delivery points
	Less than 200	200-400	401-600	601-800	801-1,000	More than 1,000	
acres							
(i) On Groceries and Household Supplies							
Less than 160.....	21	39	51	63	59	56	33
161- 320.....	22	47	57	46	68	54	37
321- 640.....	29	63	67	82	70	75	48
641- 960.....	32	71	75	90	86	84	52
961- 1,280.....	35	79	73	94	91	87	55
More than 1,280.....	41	73	78	100	93	88	58
All Farms.....	30	62	67	81	77	73	47
(ii) On Farm Supplies							
Less than 160.....	17	31	40	59	38	42	26
161- 320.....	19	40	54	62	48	53	33
321- 640.....	32	58	69	75	70	72	48
641- 960.....	42	71	82	82	76	85	58
961- 1,280.....	46	75	86	89	85	85	61
More than 1,280.....	52	84	84	98	95	88	67
All Farms.....	33	59	69	75	69	70	48
(iii) On Farm Machinery							
Less than 160.....	11	26	38	60	42	39	22
161- 320.....	11	34	50	64	45	56	28
321- 640.....	16	56	63	73	62	72	38
641- 960.....	19	64	71	87	76	85	43
961- 1,280.....	19	70	70	89	88	81	43
More than 1,280.....	23	70	74	94	93	85	47
All Farms.....	16	54	62	75	67	70	37

(ii) *On Farm Supplies* — About 48 per cent of the respondents spent more than \$500 per year, on farm supplies, at their grain delivery point. The response rate varies considerably by size of farm and by size of delivery point. By size of farm, regardless of the size of delivery point, it varies from a low of 26 per cent for the smallest size of farms to 67 per cent for the largest size of farms. By size of delivery point, regardless of farm size, it varies from a low of 33 per cent for the smallest size of delivery point, to a high of 75 per cent for the 601-800 persons size group.

(iii) *On Farm Machinery* — About 37 per cent of the respondents spent more than \$500 per year, on farm machinery, at their grain delivery point. The response rate varies considerably by both size of farm and size of delivery point. By size of farm, regardless of delivery point size, it varies from 22 per cent for the smallest size of farms to 47 per cent for the largest. By size of delivery point, regardless of farm size it varies from 16 per cent at the smallest size delivery points to 75 per cent at the 601-800 persons delivery point size.

SUMMARY AND CONCLUSIONS

The results of question 1 may be ranked on the

basis of the total proportion of "yes" response, for the six reasons for choosing a delivery point, as follows:

1. shortest hauling distance
2. preference for elevator company
3. best road access
4. good shopping facilities
5. banking, business, etc.
6. other reasons.

"Shortest hauling distance" was the most important, of the reasons given, for a grain producer delivering to his particular delivery point. It ranked almost 30 percentage points higher than "preference for the elevator company" and "best road access".

The two factors "good shopping facilities" and "banking, business, etc." although low in total response (28 per cent and 25 per cent respectively) are highly influenced by the size of the delivery point. If one deletes the smallest size of delivery point the proportion of "yes" responses for the two factors would be about 50 per cent. The extremely low proportion of "yes" responses (11 per cent and 5 per cent respectively) indicates the lack of facilities for business transactions that exists at many of these delivery points.

The replies to the question on expenditures showed

that they varied by size of farm and by size of delivery point. As farm size increased and as the size of the point to which producers delivered grain increased, a greater proportion of producers indicated that they spent more than \$500 per year in each expenditure category.

The item most greatly influenced by the size of the delivery point is the expenditure on farm machinery. For the smallest size of delivery point (less than 200 persons) only 16 per cent of the producers indicated that they spent more than \$500 per year. This varies from 11 per cent for the smallest farms to 23 per cent for the largest. Since 55 per cent of the delivery points in the survey were of a size less than 200 persons, it appears that many grain producers delivering to elevators in this size group must go elsewhere for purchases of farm machinery as well as for groceries, household and farm supplies.

In the Prairies Provinces the number of grain delivery points is declining. Those delivery points which are being closed invariably are in the smallest size group (less than 200 persons). There are many

reasons why points are being closed. One is that grain delivery points with only one grain elevator and limited or no other service activities are losing their proportion of permit holders to larger centres. As the volume of grain handled through an elevator declines or remains at an already uneconomic level and major repairs are necessary to maintain that site, it is closed. Many of the small delivery points have grain elevators which are fully or almost fully depreciated. Therefore, they remain in operation until recapitalization, in the form of heavy repairs, makes the site uneconomic. This trend of consolidation of grain delivery points will undoubtedly continue.

Branch line rationalization, if carried out to any degree, would probably affect most those producers who deliver to points in the smallest size group. This would mean a change in their grain delivery pattern but probably little or no change in their pattern of purchases of groceries, farm supplies and farm machinery which many already purchase at centres other than their grain delivery point.

CHARACTERISTICS OF HOLDERS OF SMALL DAIRY QUOTAS, 1967-68

W. Y. Yang

Canadian dairy policy is directed towards rationalizing the industry. In the 1967-68 dairy support year the Canadian Dairy Commission introduced a global subsidy eligibility quota, which was directly related to the domestic consumption of milk marketed by manufacturing milk and cream shippers. Individual shippers were allotted quotas to the extent of their deliveries in the 1966-67 support year, with the exception of those producers who had deliveries of less than 50,000 pounds of milk or the equivalent in cream. The latter group was given an open quota of up to 50,000 pounds of milk or cream equivalent.

Those producers whose deliveries were below 12,000 pounds of milk or 420 pounds of butterfat in 1967-68 received a phasing-out payment in 1968-69. Those producers who shipped between 12,000 and 50,000 pounds of milk, or between 420 pounds and 1,750 pounds of butterfat, in 1967-68 were required to reapply for a subsidy in 1968-69. Application forms mailed to these producers contained a questionnaire designed to assist the Canadian Dairy Commission to understand the income situation of those farmers with small dairy herds, and to assess the impact of subsidy payments on the welfare of these producers.

Among the questions on the application form were the following: (1) the percentage of total farm cash receipts from the sales of cream and manufacturing milk (including federal dairy subsidies) in 1967-68, (2) the acreage of cultivated land operated, (3) if there was a son more than 16 years of age working full-time on the farm, and (4) employment in off-farm work during the previous year. In all, some 50,000 questionnaires were returned, and 37,599 of these

farmers became quota holders in 1968-69. It probably should be emphasized that these are not all of the quota holders registered with the Canadian Dairy Commission; they are only those shipping between 12,000 and 50,000 pounds of manufacturing milk or between 420 pounds and 1,750 pounds of butterfat. The remainder of this paper will summarize the information obtained from the questionnaire.

Distribution of Farmers

More than 23 per cent of the holders of these small dairy quotas resided in the Province of Quebec (Table 1). Almost 21 per cent resided in Saskatchewan and 19 per cent in Alberta. The three Prairie Provinces together had almost 55 per cent of the farmers, the Maritime Provinces had about 8 per cent.

Distribution of Production

The 37,599 farmers shipped a total of 3.6 million pounds of butterfat during 1967-68 (Table 1). The Province of Quebec had the largest volume of production, almost 27 per cent of the total. Just over 50 per cent of the total production was in the Prairie Provinces and slightly less than 8 per cent was in the Maritime Provinces.

Average Size of Shipment

The average quantity of butterfat shipped per farmer was 960 pounds (Table 1). Producers in the Province of Quebec had the largest average ship-

TABLE 1— NUMBER OF FARMERS SHIPPING LESS THAN 1,751 POUNDS OF BUTTERFAT, AND AVERAGE QUANTITY SHIPPED, BY PROVINCE, 1967-68

	Farmers		Butterfat Shipments		Shipment per Farmer
	Number	Per cent	Hundred- weights	Per cent	Hundred- weights
Prince Edward Island.....	1,328	3.5	13,413	3.7	10.1
Nova Scotia.....	617	1.6	5,503	1.5	8.9
New Brunswick.....	986	2.6	9,423	2.6	9.6
Quebec.....	8,751	23.3	96,368	26.8	11.0
Ontario.....	5,098	13.6	51,769	14.4	10.2
Manitoba.....	5,662	15.1	51,360	14.3	9.1
Saskatchewan.....	7,886	20.9	65,388	18.2	8.3
Alberta.....	7,111	18.9	65,416	18.2	9.2
British Columbia.....	180	0.5	1,548	0.4	8.6
CANADA.....	37,599	100.0	360,188	100.0	9.6

TABLE 2—DISTRIBUTION OF FARMS BY NUMBER OF ACRES OF CULTIVATED FARM LAND, BY PROVINCE, 1967-68

	Number of Acres					Total
	Less than 10	10-129	130-399	400-759	More than 759	
				per cent		
Prince Edward Island.....	1	87	12	0	a	100
Nova Scotia.....	9	87	4	a	0	100
New Brunswick.....	2	88	9	a	a	100
Quebec.....	1	88	11	a	a	100
Ontario.....	1	79	20	a	a	100
Manitoba.....	1	23	56	18	2	100
Saskatchewan.....	a	7	47	36	10	100
Alberta.....	a	16	57	22	5	100
British Columbia.....	9	68	18	5	9	100
CANADA.....	1	46	35	15	3	100

* Less than 0.5 per cent.

ment at 1,100 pounds. British Columbia farmers had the smallest average shipment at 860 pounds. Farmers in Saskatchewan, Alberta, Manitoba and Nova Scotia also had shipments smaller than the national average.

Size of Farm

Forty-seven per cent of the 37,599 farmers had less than 130 acres of cultivated farm land (Table 2). In the four eastern provinces almost all of the farmers were in this category. Ninety-six per cent of the farmers in Nova Scotia had less than 130 cultivated acres, 90 per cent in New Brunswick, 89 per cent in Quebec, and 88 per cent in Prince Edward Island. In Ontario, the proportion was 80 per cent and in British Columbia 77 per cent. In the Prairie Provinces more than half of the farmers had between 130 and 399 acres. In Saskatchewan 46 per cent had more than 400 acres, in Alberta 27 per cent, and in Manitoba 20 per cent.

Number with Sons on the Farm

Of the 37,599 farmers, 85 per cent reported they had no sons more than 16 years of age working full-time on the farm (Table 3). The province with the highest proportion of farmers reporting sons on the farm was Quebec at 20 per cent. The province of Nova Scotia and British Columbia had the smallest proportion of farmers reporting sons on the farm at about 9 per cent. The Prairie Provinces were more or less midway in the range at about 15 per cent.

Proportion of Farm Cash Receipts From Dairying

More than half the farmers reported that they received less than 25 per cent of their total farm cash receipts from manufacturing milk and cream (including federal subsidy) (Table 4). About 20 per cent reported that their butterfat sales accounted for between a quarter and a half of their total farm cash receipts. Thus, more than 70 per cent of these farm-

TABLE 3—NUMBER AND PERCENTAGE OF FARMERS WITH SONS WORKING FULL-TIME ON THE FARM, BY PROVINCE, 1967-68

	Farmers with Sons		Farmers without Sons	
	Number	Per cent	Number	Per cent
Prince Edward Island.....	215	16.2	1,113	83.8
Nova Scotia.....	53	8.6	564	91.4
New Brunswick.....	124	12.6	862	87.4
Quebec.....	1,773	20.3	6,978	79.7
Ontario.....	541	10.6	4,557	89.4
Manitoba.....	839	14.8	4,823	85.2
Saskatchewan.....	1,224	15.6	6,642	84.4
Alberta.....	946	13.3	6,165	86.7
British Columbia.....	16	8.9	164	91.1
CANADA.....	5,731	15.2	31,868	84.8

TABLE 4—DISTRIBUTION OF FARMERS BY PROPORTION OF FARM CASH RECEIPTS FROM DAIRYING, BY PROVINCE, 1967-68

	Farmers With Sons*			Farmers Without Sons*		
	Cash Dairy Receipts as a Percentage of Total Farm Cash Receipts			Cash Dairy Receipts as a Percentage of Total Farm Cash Receipts		
	Less than 25 per cent	25 to 50 per cent	More than 50 per cent	Less than 25 per cent	25 to 50 per cent	More than 50 per cent
	per cent					
Prince Edward Island.....	31	38	31	25	38	37
Nova Scotia.....	31	30	39	28	29	43
New Brunswick.....	25	46	29	27	28	45
Quebec.....	20	24	56	17	22	61
Ontario.....	54	23	23	43	28	29
Manitoba.....	70	16	14	64	21	15
Saskatchewan.....	82	12	6	81	12	7
Alberta.....	77	15	8	72	17	11
British Columbia.....	50	13	37	39	28	33
CANADA.....	53	19	28	52	20	28

* No separate tabulation was made for all producers. Since producers without sons represent about 85 per cent of all producers, averages for all producers should be very close to those for producers without sons.

ers with small dairy quotas received less than half of their farm cash receipts from dairying.

Dairy receipts were more of a supplementary source of income in the Prairie Provinces than in other provinces. Much the largest proportion of the farmers in the Prairie Provinces received less than 25 per cent of their farm cash receipts from dairying. The farmers in Quebec were the most dependent on dairy sales as a source of income, 61 per cent received more than half of their income from this source. Cash dairy receipts were also quite important to farmers in the Maritime Provinces. In New Brunswick, 45 per cent received more than 50 per cent of their farm receipts from this source, 43 per cent in Nova Scotia, and 37 per cent in Prince Edward Island.

off-farm work during 1967-68 (Table 5). British Columbia had the largest proportion of farmers reporting off-farm work at 28 per cent. Saskatchewan had the smallest proportion at 14 per cent.

Farmers with sons working full-time on the farm more often reported off-farm work than those without sons, but for all of Canada the difference was only 1.5 per cent. Only in Nova Scotia and British Columbia was there a substantial difference in the proportion, 7 per cent and 10 per cent respectively.

Only in Ontario and Prince Edward Island did farmers without sons more often report off-farm work than did farmers with sons. In Prince Edward Island the difference was less than 0.5 per cent, but in Ontario it was 4 per cent.

Summary

The provinces of Quebec, Saskatchewan and Alberta had relatively large numbers of farmers with

Off-Farm Employment

Only 18 per cent of the 37,599 farmers reported

TABLE 5—NUMBER AND PERCENTAGE OF FARMERS WITH OFF-FARM EMPLOYMENT IN 1967-68

	All Farmers			Farmers With Sons			Farmers Without Sons		
	Total Number	With Off-Farm Work		Total Number	With Off-Farm Work		Total Number	With Off-Farm Work	
		Number	Per cent		Number	Per cent		Number	Per cent
Prince Edward Island.....	1,328	238	17.9	215	38	17.7	1,113	200	18.0
Nova Scotia.....	617	137	22.2	53	15	28.3	564	122	21.6
New Brunswick.....	986	217	22.0	124	30	24.2	862	187	21.7
Quebec.....	8,751	1,993	22.8	1,773	404	22.8	6,978	1,589	22.8
Ontario.....	5,098	972	19.1	541	84	15.5	4,557	888	19.5
Manitoba.....	5,662	1,023	18.1	839	153	18.2	4,823	870	18.0
Saskatchewan.....	7,886	1,126	14.3	1,224	221	18.0	6,662	905	13.6
Alberta.....	7,111	1,111	15.6	946	165	17.4	6,165	946	15.3
British Columbia.....	180	51	28.3	16	6	37.5	164	45	27.4
CANADA.....	37,599	6,868	18.3	5,731	1,116	19.5	31,868	5,752	18.0

small dairy quotas in 1967-68. More than 63 per cent resided in these three provinces. The total quantity of butterfat shipped followed a similar pattern of distribution by province. The average quantity of butterfat shipped per producer, was largest in Quebec.

Fifty-two per cent of the farmers received 75 per cent or more of their farm cash receipts from sources other than manufacturing milk and cream (including federal subsidies). More than 70 per cent depended on sources other than dairy for more than half of their farm cash receipts.

Farmers in the Prairie Provinces were less dependent on dairy as a source of income than were those in other provinces. The Quebec farmers were the most dependent on dairy as a source of farm cash receipts.

Outside of the Prairie Provinces, the largest proportion of the farmers had less than 130 acres of cultivated farm land.

Only a small proportion, 15 per cent, of the farmers had sons more than 16 years of age working full-time on the farm.

A small volume of sales of manufacturing milk and cream does not necessarily mean that the farmer has a small farm income. Many farmers receive large proportions of their income from other than dairy enterprises and from off-farm employment.

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COSTS OF OPERATING AIRCRAFT FOR AGRICULTURAL AND FORESTRY USE, 1967

L. E. Philpotts and T. O. Riecken

During the past 10 years there has been a steady increase in the use of aircraft for agricultural purposes, in terms of acres covered and hours flown (1). Because of the increasing interest in aircraft as a tool in agricultural operations, there is a need for information on their costs of operation.

This report deals with costs pertaining to aerial application in the agriculture and forest industries in Canada in 1967. The data included are for spraying activities for control of weeds, brush, insects and plant diseases, as well as seeding, fertilizing and defoliating. During interviews with 29 private and 31 commercial operators, information was obtained on the amount and kind of aerial application work done with 97 aircraft and the costs of operation were obtained for 72 aircraft. Private operators were those farmers who owned aircraft that they used for aerial application on their own land or lands of other farmers for hire. The spraying operations of these operators were restricted to a 25 mile radius of their home base by Air Transport Committee regulations. Commercial operators were non-farmers and farmers who do aerial application work for hire and who had a Class 7 Specialty License from the Air Transport Committee.

Of the 60 operators interviewed, 13 were commercial operators in Eastern Canada, and 18 were commercial operators and 29 were private operators in Western Canada.

AIRCRAFT USE

The 60 operators interviewed in this study did a total of 1.4 million acres of aerial application work in 1967. Of this amount, 738,848 acres were forest and 630,177 acres were agriculture (Table 1). The operators in Eastern Canada did more than four times as much forestry work as agricultural work, whereas in Western Canada, almost all the work was agricultural.

Agricultural operations required a total of 7,445 hours of flying time, and forestry 1,798 hours (Table 2). A total of 6,197 hours was actually spent in aerial application in agriculture, and 1,370 in forestry. The remainder of the flying time was for flying from the home base to the working base, from the working base to the application area, and return to home. The private operators, restricted to a 25 mile radius of their home base by Air Transport Committee regulations, spent less time on ferrying

than the commercial operators who are not so restricted.

In Eastern Canada, about 80 per cent of the agricultural acreage treated by aircraft application was for control of insects and pests, 10 per cent was for fertilizing, and 6 per cent for weed control. In Western Canada, about 90 per cent of the agricultural work done by commercial operators was for weed control, mainly for control of broad-leaf weeds. Private operators in this region were almost exclusively occupied in weed control work, only about 1 per cent of the hours flown were for other purposes.

COSTS OF OPERATION

The costs of an aerial applying enterprise are for aircraft operation; equipment, labor and vehicles for ground services; and hangar and landing fields. Both the quantity of and the cost of the supplies and services used are influenced by the type of the applying activity, region of operation, quality of services, taxes and license requirements, as well as the efficiency of the machines.

Fixed Costs

Those costs that have to be met irrespective of the amount of use of the aircraft include aircraft, ground equipment, hangar, fields, licenses, insurance and business fees. The largest cost is that of the aircraft itself.

Aircraft Costs — It is difficult to establish a depreciation cost for aircraft. The types of aircraft used in most aerial spraying operations, depreciate rapidly during the first five to seven years of life and then maintain a relatively constant value. This is largely because Air Transport Commission regulations stipulate the condition of an aircraft before it can receive a certificate of airworthiness. Sometimes, this results in serviceable aircraft being worth more than their age indicates. For example, an aircraft may actually appreciate in value because of having a new engine installed. In this study, depreciation was based on the present expected life of the machine. Both depreciation and interest costs were based on an investment that included application equipment and radios as well as the basic aircraft. Interest was estimated at 6.5 per cent of the present value of the aircraft.

Licenses, registration and business fees are usually small costs. They arise from government regulations

TABLE 1—AIRCRAFT USE; ESTIMATED NUMBER OF ACRES OF AERIAL APPLICATION BY REGION AND TYPE OF WORK, 60 OPERATORS, 1967

	Eastern Canada	Western Canada		
	Commercial Operators	Commercial Operators	Private Operators	Total
Number of aircraft.....	38	30	29	97
Agricultural Work:	number of acres			
Weed control.....	9,225	251,727	173,306	434,258
Brush control.....	—	30,060	1,295	31,355
Insects and plant disease control.....	143,130	4,190	110	147,430
Fertilizing.....	14,369	840	—	15,209
Other.....	1,165	160	600	1,925
Sub-totals.....	167,889	286,977	175,311	630,177
Forestry Work:				
Brush control.....	31,086	1,000	—	32,086
Forest Insect control.....	205,057	—	—	205,057
Mosquito and black fly control.....	498,500	1,800	—	500,300
Other.....	1,405	—	—	1,405
Sub-totals.....	736,048	2,800	—	738,848
Other Work:				
Urban mosquito control.....	37,280	—	200	37,480
Other.....	—	204	161	365
Sub-totals.....	37,280	204	361	37,845
Grand totals.....	941,217	292,981	175,672	1,409,870

TABLE 2—AIRCRAFT USE; NUMBER OF HOURS FLOWN BY REGION, 60 OPERATORS, 1967

	Eastern Canada	Western Canada		
	Commercial Operators	Commercial Operators	Private Operators	Total
Number of aircraft.....	38	30	29	97
Agricultural Work:	number of hours			
Applicating.....	3,055	1,944	1,198	6,197
Ferrying.....	444	521	283	1,248
Sub-totals.....	3,499	2,465	1,481	7,445
Forestry Work:				
Applicating.....	1,347	23	—	1,370
Ferrying.....	421	7	—	428
Sub-totals.....	1,768	30	—	1,798
Other Work:				
Applicating.....	96	24	5	125
Ferrying.....	20	32	7	59
Sub-totals.....	116	56	12	184
Grand totals.....	5,383	2,551	1,493	9,427
Hours per aircraft.....	142	85	52	97

regarding the operation of the aircraft and the applicating business, and the regulations are such that some operators are exempt from some license and registration fees. Aircraft registration costs \$10 and covers the full period of ownership of the aircraft. The Provinces of Alberta and Ontario levy a fee of \$10 for licensing for application of pesticides. Business fees and licenses are required for commercial operators in some areas in some provinces.

Aircraft insurance is a major item of expense for commercial operators, most carry some form of hull insurance. They are required by legislation to have at least \$250,000 of "public liability-property damage" insurance. Generally, private operators did not carry this form of insurance, and when carried it was only for small amounts.

Ground Support Equipment Costs—Ground support equipment most commonly reported included water

TABLE 3—COST PER AIRCRAFT AND PER HOUR OF AERIAL APPLYING IN WESTERN AND EASTERN CANADA, 1967

	Western Canada						Eastern Canada			
	Group A		Group B		Group C		Group D		Group E	
	Per Aircraft	Per Hour Flown	Per Aircraft	Per Hour Flown	Per Aircraft	Per Hour Flown	Per Aircraft	Per Hour Flown	Per Aircraft	Per Hour Flown
dollars										
Fixed costs										
Aircraft	499	9.42	1,745	27.27	4,953	46.73	1,396	15.01	5,848	27.20
Ground support	87	1.64	123	1.92	285	2.69	18	.19	261	1.21
Hangar and field	214	4.04	251	3.92	300	2.83	212	2.27	556	2.59
Sub totals	800	15.10	2,119	33.11	5,538	52.25	1,626	17.47	6,665	31.00
Variable costs										
Aircraft operation										
Maintenance	493	9.30	595	9.30	704	6.64	694	7.46	2,571	11.96
Gas and lubrication	138	2.60	251	3.92	577	5.44	319	3.43	1,387	6.45
Pilot salary	934	17.62	1,171	18.30	2,203	20.78	1,490	16.02	5,348	24.87
Ground support										
Maintenance	71	1.34	49	.77	88	.83	18	.19	215	1.00
Labor	492	9.28	494	7.72	875	8.25	251	2.70	3,311	15.40
Vehicles	169	3.19	325	5.08	1,126	10.62	186	2.00	917	4.26
Hangar and field	57	1.08	42	.66	45	.42	100	1.08	1,128	5.25
Sub totals	2,354	44.41	2,927	45.75	5,618	52.98	3,058	32.88	14,877	69.19
Grand totals	3,154	59.51	5,046	78.86	11,156	105.23	4,684	50.35	21,542	100.19
Modal aircraft size (h.p.)	90		150		235		150		235	
Hours flown per aircraft										
Average	53		64		106		93		215	
Range	12-102		21-127		30-181		17-200		117-287	
Number of aircraft in group	10		27		13		12		10	

tanks, fuel tanks, mixing tanks, pumps, trailers, and two-way radios. Fixed costs estimated for this equipment consisted of a depreciation allowance based on initial cost and an interest charge based on present value. A few operators carried insurance on ground equipment but the average outlay for this type of insurance was small.

Some aircraft operators rented ground equipment or had the contractee provide it. Operators in Eastern Canada were more likely to rent or have equipment supplied than those in Western Canada. When equipment was rented, the rent was considered a fixed cost.

Hangarage and Landing Field Costs — Private operators, usually, had their own landing strips. Runways, about 60 by 1,260 or 2,640 feet, were built next to the hangars. Where possible, pasture land or low productivity land was used. Commercial operators usually operated from municipal airfields.

Some operators tied down their aircraft outside during the summer. Only one left his aircraft outside all year round. Hangar facilities varied greatly. Most private operators had small wooden or metal one-aircraft hangars. Others rented space at local airports. Commercial operators usually had more elaborate facilities, many of them rented facilities at municipal airports.

Fixed costs for hangars and landing fields include depreciation on hangars, interest on investment in land and buildings, taxes on land and buildings, and insurance. There was a substantial difference in the amount of taxes paid between Eastern and Western aircraft operators. For the most part, buildings as a part of a farm are not assessed for taxation in the Prairie Provinces. Accordingly for private operators in this region, a tax charge was allocated for only the area in landing fields. Because the average field was only about five acres in size the taxes were relatively small items of expense. Few operators had insurance on hangars and other buildings. Rent paid for hangars and landing fields was treated as a fixed cost.

Variable Costs

Variable costs calculated included major overhauls and other maintenance, aircraft decontamination, fuel, lubrication, and pilot's salary.

Maintenance Costs — The important maintenance costs are those incurred for major overhauls, annual certificate of airworthiness and general repairs. The term "major overhaul" generally implies major engine overhaul. This report allocates major overhaul costs to aircraft hull, radio and applying equip-

ment as well as the engine. Hull overhaul including refabricating is very costly as the labor requirements are high. Fabric lifetime varies according to amount of use and whether the aircraft is hangared or tied down in the open. Chemicals may also corrode the underside of the aircraft accelerating deterioration of fabric.

It is mandatory that all aircraft engines undergo a major overhaul when a specified number of hours has been reached, regardless of supposed mechanical condition at the time. The maximum is 1,200 hours. A major or top overhaul may, of course, be necessary before the specified overhaul figure is reached. A major overhaul is expensive. A rule of thumb often used for estimating this cost is \$10 for each horsepower. This cost includes both labor and parts.

Fifty and 100 hour inspections and certificates of airworthiness are also required by legislation. Commercial aircraft undergo rigorous inspection, being inspected every 50 hours or seven days, whereas private aircraft need be inspected only every 100 hours of flying time. Consequently 100-hour inspections and 100-hour annual airworthiness inspections may be carried out simultaneously.

The major overhauls and inspections occur in lumps throughout the life of the aircraft. This irregularity can distort the average picture of costs. Accordingly a variable annual cost for major overhaul was assigned to each aircraft on the basis of the number of hours flown in the study year. Costs of 50 and 100-hour inspections were similarly allocated. Other costs include general repairs such as wind-screens and tires.

Decontamination costs are relatively small and vary with use. Decontamination is necessary to clean the hull of the aircraft, spray tanks and applying equipment to prevent corrosion, and is also necessary when different chemicals are used.

Gas and lubrication—Prices paid for fuel ranged from 37 cents per gallon to 60 cents. The variation resulted from differences in taxation policy in the provinces and contractual arrangements between operators and fuel suppliers. Lubrication costs for engine oil were low. Generally Eastern operators had lower fuel costs than the Western operators.

Pilot salary—Although the cost per hour for an individual aircraft if paid on an hourly or unit of work basis is a variable cost some hiring arrangements had elements of a fixed cost. Most pilots were paid on a rate per acre basis but there were other arrangements. In Western Canada pilots flying aircraft of 135 to 150 horsepower and from 230 to 235 horsepower were paid a flat rate per acre treated, according to crop or brush treatment with the latter being higher. In contrast, pilots of private and commercial air-

craft ranging from 85 to 95 horsepower were mostly paid on an hourly basis. A few agreements provided for a basic sum plus payment per acre treated. Pilots in Eastern Canada were mostly paid on an acre basis and the rate was much greater than the Western rate, reflecting the differences in rate of spraying in the two environments. Pilots spraying crops in Eastern Canada were paid at a higher rate than those doing mosquito control and forestry work.

In addition to the wages paid per hour or acre of work the operator must make allowances for cost of pension plans, unemployment insurance and workmen's compensation. Generally on an hourly basis the cost of pilots was more for the larger planes than for the smaller ones.

Ground Support Costs—Costs for maintenance and repair of ground support equipment were incurred by most operators but for the most part it was not a major cost. As there was some rental of ground equipment or arrangements for the contractor to supply it in Eastern Canada, these costs were shown in the form of a rental and as a fixed cost.

Ground support labor included flagmen, truck drivers, mixers, managers of the aerial application enterprise, air service salesmen, and payment for mapping services. Cost of ground labor included wages paid directly to employees and liability insurance, pension, unemployment insurance and workmen's compensation deduction where applicable.

In smaller operations some employees worked at several tasks. The larger commercial operations are characterized by a greater specialization of labor. On the Prairies most of the private operators employed two flagmen who often doubled as truck drivers and mixers, although a few private operators hired drivers and mixers as such. Flagmen were not generally used in Eastern Canada in agricultural spraying. Small fields and natural landmarks enable an experienced pilot to operate without flagmen. In the Prairies this is not so. A pilot flying long passes over flat object-free cropland would be at a loss without flagmen to guide him.

Flagmen were for the most part hired on an acre-treated basis and the most commonly quoted basis was about 2 cents per acre per man with a range of 1.5 to 5 cents per acre. Hourly rates for flagmen, drivers and mixers, were about \$2. Eastern operators reported more ground labor costs for administration and management than Western operators. Although costs of flagmen and markers were less in Eastern Canada there was more outlay for mapping, selling and administration.

Vehicle costs were assigned to the aerial application on a flat rate per mile of use in the applying activity or in the case of rented vehicles the total

TABLE 4—HOURS FLOWN, ACRES TREATED PER HOUR AND COST PER ACRE FOR SELECTED GROUPS OF AIRCRAFT, 1967

Type of Aircraft	Hours Flown	Average Acres Treated per Aircraft	Acres Treated Per Hour Flown	Total Cost Per Acre Treated
		number		dollars
Western Canada:				
Group A (90 h.p.)	53	5,659	108	.56
Group B (150 h.p.)	64	7,238	113	.70
Group C (235 h.p.)	106	12,950	122	.86
Eastern Canada:				
Group D (150 h.p.)	93	4,581	49	1.01
Group E (235 h.p.)	215	20,537	96	1.05

rental fee was charged. In Western Canada, private operators for the most part used vehicles which were essentially farm trucks or personal automobiles. These operators, being restricted to a 25 mile radius of their home base, had relatively low vehicle costs. In Eastern Canada, operators had a tendency to make more use of rental vehicles. Vehicle costs were charged at rates ranging from 10 to 13 cents per mile, with 12 cents the most common rate. This covered vehicle investment, depreciation and fuel, repairs and other costs.

Hangarage and Field Costs — Hangar and field costs include maintenance on buildings and landing strips, utilities, services, and supplies to operate and maintain the buildings and strips. Private strips were often grassed and required some grass mowing.

Operating Costs Per Hour Flown

Three groups of aircraft in Western Canada and two in Eastern Canada were selected for a detailed analysis of the costs of the applying enterprise. Costs were obtained for a total of 72 aircraft (Table 3).

Western Canada — The three groups of aircraft are designated as Groups A, B and C. Group A was comprised of 10 aircraft such as the Piper J3, PA 11 and Aeronca 7AC. The modal size of these aircraft was about 90 horsepower. Seven of the aircraft were privately operated and three were commercial. The aircraft in this group were comparatively old, having been manufactured before 1957. Accordingly, investment and depreciation costs were low. The average current value was about \$2,700 per aircraft. Eight of the 10 aircraft were acquired by the present owners between 1963 and 1966. The average total cost per hour flown was \$60 of which \$44 were variable costs. The standard deviation of the variable costs was \$7.

Group B was comprised of 27 aircraft such as the Piper PA 18 and PA 18A, Cessna 170 and 172 and the Champion 7GCB. The horsepower of these air-

craft was in the range of 135 to 150. Eleven of the aircraft were privately operated and 16 were commercial. Eighty per cent of the aircraft in this group were manufactured since 1955; 85 per cent were acquired by the present owners between 1963 and 1967. The average present value was \$8,300 per aircraft. The average total cost per hour flown was \$79. The average total variable cost per hour was \$46, with a standard deviation of \$13.

Group C was comprised of 13 aircraft such as the Piper A25, Callair A9A, Cessna Ag.-Wagon 230, and Cessna 180. The modal size was 230 to 235 horsepower. Two of the aircraft were privately operated and 11 were commercial. Eleven of the 13 aircraft were made during the years 1965 to 1967. The average present value was about \$11,100 per machine. Depreciation costs for this group of aircraft were relatively high because of their relative newness. The average total operating cost per hour was \$105 of which \$53 were variable costs.

Eastern Canada — All the aircraft in this region were commercially operated. The variable costs differ somewhat from those in Western Canada because of differences in the method of operation. For instance, although flagmen are not required in Eastern Canada, other types of service such as mapping and selling were more prevalent.

The two groups of aircraft studied in Eastern Canada were designated as Groups D and E. Group D was comprised of 12 aircraft such as the Piper PA 18 and the PA 25/150. The modal size was 150 horsepower. Although all were made in 1964 or earlier all were acquired by the present owners after 1964. The average present value was \$6,500 per aircraft. The average total cost per hour flown was just over \$50 of which \$33 were variable costs.

Group E was comprised of 10 aircraft such as the Piper PA 25 and Callair A9A. The modal size was 235 horsepower. All aircraft in this group were made after 1960, most after 1965. The average present value was \$15,700 per aircraft. This resulted in a

substantially higher fixed cost per aircraft than for the other groups. However, the average total fixed costs per hour flown for Group E are lower than for Group C (the group of aircraft of similar size in Western Canada) because the hours flown per aircraft are double. The average total cost per hour flown by Group E was \$100 of which \$69 were variable costs.

Costs Per Acre

Many factors affect the cost per acre of aerial application work. Differences in terrain, ferrying distance, field size, crops, and type of application affect the rate at which work can be done. In Western Canada more acres were treated per hour than in Eastern Canada, with a similar size of aircraft. Costs per acre were considerably higher in Eastern Canada than in Western Canada.

Estimated costs per acre treated for each of the five groups of aircraft are shown in Table 4. Costs ranged between \$0.50 and \$1.05 an acre. The larger the aircraft, the higher the cost per acre treated. This was largely due to newer aircraft and higher depreciation rates, and some unused capacity. Because of the small number of aircraft in these groups the data should be considered only as an indication of the cost per acre.

SUMMARY

Costs of operating aircraft for applying chemicals to crops and forests in 1967, were obtained from 60 operators.

For analysis, the aircraft were grouped by modal horsepower rating. There were three groups in Western Canada, 90, 150 and 235 horsepower; and two groups in Eastern Canada, 150 and 235 horsepower.

Costs of operation varied with the size of the aircraft, region of operation, age of aircraft, and

whether the aircraft was privately or commercially operated.

Depreciation and interest on investment were large items of expense, particularly for the larger aircraft, most of which were relatively new. Costs per hour flown ranged from \$60 for the 90 horsepower group to \$105 for the 235 horsepower group, both in Western Canada. Costs per aircraft were higher in Eastern Canada than in Western Canada, but because more hours per aircraft were flown in Eastern Canada, the costs per hour were less. On the basis of acres treated, costs increased as the size of the aircraft increased. Costs per acre were higher in Eastern Canada than in Western Canada.

The demand for aircraft work varies from year to year, depending to some extent on weather conditions that affect ground operations. The amount of work performed by aircraft operators in Western Canada in 1967 was somewhat less than in an average year. The data in this report are group averages for aircraft operated under a variety of conditions and only for one year. The user of these data should keep this in mind.

ACKNOWLEDGEMENTS AND REFERENCES

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- (3) Acknowledgement is made of assistance received from: M. Hicks, F. Scott-Pearse and R. Bradley in Ontario, and to P. Watson, J. Harlton and D. Schiefner in Saskatchewan, for pre-testing the questionnaire; to D. Hildebrandt and T. Petrie for assisting with the tabulation, and to J. Atcheson and A. Trempe for assisting with enumeration and analysis. Special thanks is due to all the aircraft operators who co-operated by providing the basic information.

THE INTERNATIONAL LABOUR ORGANIZATION AND CANADIAN AGRICULTURE, 1919 TO 1969

A. B. Andarawewa

The International Labour Organization was created in 1919, to be responsible for organizing international co-operation in the study of labour problems and for the adoption of international standards for the protection of workers. Since then it has enlarged its activities to include international technical co-operation. The number of member-states increased from the 45 initial members in 1919 to 118 in 1968. Canada has participated in the I.L.O. since its inception.

The I.L.O. has been concerned with human rights and human welfare throughout the world. It works closely with other United Nations agencies such as the United Nations Children's Fund, United Nations Development Programme, Food and Agriculture Organization, World Health Organization, and the United Nations Educational Scientific and Cultural Organization. The I.L.O. was however unique in that it was the first international organization to regard social and economic rights as basic human rights and to adopt standards for the protection of these rights.

THE WORKING OF THE INTERNATIONAL LABOUR ORGANIZATION

Although the I.L.O. is an inter-governmental body, employers and workers take part in the work. Each member-state sends four delegates, two from government and one each representing the employers and workers of that country, to the Annual International Labour Conference. The main function of the Annual Conference is to adopt instruments which lay down standards in respect of social welfare, labour administration and human rights. These standards are in the form of conventions or recommendations and together they make up the International Labour Code. Conventions are intended, upon ratification by a member country, to create binding legal obligations. Recommendations are not open to ratification but are meant to provide guidance in the development of policy and legislation. The importance of the value of the Code can be measured not so much by its content but by examining the extent to which member countries have, upon ratification, enacted their own standards and practices and vigorously implemented them. The real value can be seen only to the extent that living and working conditions of workers in member countries have improved during the years.

By June 1967, the Conference had adopted 128 conventions and 131 recommendations. Of these conventions and recommendations, 20 related to various aspects of agriculture. Among these were holidays with pay; minimum age for employment; minimum wages; insurance plans for old age, survivors, health, unemployment and sickness; rights of association; workmen's compensation; maternity protection; and vocational training programs. Most of the instruments were adopted during the 1920's and 1930's. Those relating to agriculture constitute the second largest group of instruments, the first being those relating to fishing, seamen and other marine activities. Eleven of the agricultural instruments are conventions and require ratification by member governments. Discussions are going on now regarding the adoption of an instrument dealing with labour inspection in agriculture.

In addition to the conventions, following a resolution of the Conference in 1963, the I.L.O. appointed a committee of experts to examine, *inter alia*, a code of practices relating to safety and health in agricultural work. In dealing with risks and hazards to agricultural workers, various countries have issued a number of sets of regulations each covering a different subject (e.g. farm buildings, tractors, pesticides) rather than an all embracing set. While some of the occupational risks such as those caused by motor vehicles, toxic substances and explosives are not specific to agriculture, agricultural conditions may require measures different to those applicable to manufacturing or other industries. The Code, incorporating the essentials of safety and health, deals in detail with risks that are peculiar to agriculture or those predominantly agricultural, and provides a useful guide for national policy in this area. It was adopted by the committee in 1964.

THE INTERNATIONAL LABOUR ORGANIZATION AND CANADIAN AGRICULTURAL LABOUR

Of the 128 conventions of the International Labour Organization, Canada had ratified 24 by January 1969. Three implementing federal statutes were declared *ultra vires* by the Privy Council in 1937. Several pieces of labour legislation in Canada require higher standards than is required by I.L.O. instruments. Because of the wide differences in economic

and social development between member countries, the instruments adopt only the levels required to satisfy minimum standards. Thus, the ratification of I.L.O. conventions in areas such as vocational education and training were not required in Canada as they had been extensively developed here.

The constitutional division of powers between the federal and provincial governments has contributed to the more or less negligible ratification of I.L.O. conventions by Canada. In matters relating to labour legislation the provincial legislatures have major jurisdiction and the power of the federal government is limited to a narrow field which covers areas and undertakings of a national, international or inter-provincial dimension. Section 92 of the British North America Act gives the provinces the authority to legislate on matters of "property and civil rights in the province". Hence, for the most part, minimum wages, minimum age for employment, hours of work, etc., which are related to civil rights, are exclusively under provincial authority.

None of the I.L.O. conventions ratified by Canada relate to agriculture. The particular structure of the Canadian agricultural labour force, of the Canadian economy, and of the Canadian system of government are among the reasons for lack of ratification of the agricultural instruments.

Historically, Canadian agriculture has been organized on the basis of a large number of owner-operated family farms. Most of the labour requirements are met by the owner-operator and his family with a small amount of labour being hired at critical cultivation and harvesting periods. Agriculture requires not only outdoor work in all types of weather but also physical effort even with increased mechanization on farms. Hence, males constitute the bulk of the agricultural labour force.

The inability to delineate a more or less homogeneous group has contributed to the problems associated with obtaining legislation related to farm labour. Farm workers are not organized into associations or unions. Because the number of persons employed by any one farm is small compared with the number employed in other industries the employer-employee relationship is on a more personal basis. Because of their wide dispersion farm workers as a group are less visible than urban workers and their problems and conditions of work are therefore not so evident.

Census reports provide data on aggregate numbers. In 1969, there were 126,983 hired farm workers in Canada, 110,181 of whom were males. Only 41,419 of the total hired farm workers had year-round jobs. Census information on education groups farmers and farm workers together. Although data on farm

wage rates are published by the Dominion Bureau of Statistics, it is next to impossible to make meaningful comparisons between wages paid to hired farm workers and those paid to workers in other industries. In total, there is little information on the socio-economic status of farm workers that can be used in determining the need for and the designing of labour legislation.

CANADIAN AGRICULTURAL LABOUR LEGISLATION

As stated earlier, provincial legislatures have major jurisdiction in the area of labour legislation. However, although labour laws covering many aspects are in force in all provinces, generally, they do not include employment in agriculture. Many provinces have not enacted legislation in this area because hired farm labour is relatively unimportant among the occupational groups. In others, various factors and pressures have acted against such legislation. In yet others, where the demand for hired labour in agriculture, especially skilled hired labour, is increasing, labour legislation is being extended to cover agricultural labour.

In general, hired farm labour is not covered by legislation that affects workers in other industries. School attendance laws are in force in all provinces specifying a statutory school leaving age. In all provinces except British Columbia and Ontario, a child may be exempted from school for a temporary period if his services are required for farm or home duties or for employment. A minimum age for employment is set in the legislation of all provinces but no minimum age has been established for employment in agriculture.

Until recently farm workers were excluded from practically all types of labour laws. Legislation enacted in Ontario and Alberta in 1968, however, while not applicable to workers employed in general farming, extended coverage to certain types of farm labour or related services.

In Ontario, a variety of horticultural, veterinarian and agricultural services are covered by the minimum wage and vacation with pay provisions of the Employment Standards Act. This Act also requires employers to give their employees a statement of their wages on each pay-day, and permits the Department of Labour to collect unpaid wages for an employee up to a maximum of \$1,000. These provisions are applicable to persons employed in farming. The provisions of the Employment Standards Act requiring equal pay for equal work, i.e., for the same work performed in the same establishment, are specifically made applicable to farm employment.

In Alberta, farm workers as a class are, as before, excluded from the Alberta Labour Act (the provincial labour code) but agricultural employees who are employed in an undertaking which, in the opinion of the Board of Industrial Relations, is a commercial undertaking are now covered for purposes of minimum wages, hours of work, vacations with pay, equal pay for equal work, labour relations and other matters covered by the Act.

All provinces except Newfoundland have equal pay legislation. (Reference was made to Ontario and Alberta above). Farm workers are not excluded, and the laws would therefore apply where a male employee and a female employee perform the same or substantially the same work. Similarly, fair employment practices laws, which are in effect in all provinces except Newfoundland, cover farm labour, subject to the exception that in Manitoba and Quebec all employers with fewer than five employees are excluded.

Farm workers in Ontario are included in the compulsory coverage of the Workmen's Compensation Act. However, in all other provinces except Quebec

and Saskatchewan, compensation is available upon the application of the individual farm employer.

Federal programs such as Social Security and Unemployment Insurance are available to farm workers and they are also eligible to join hospital and medical insurance programs. The implementing agencies of these programs will require information on earnings, educational levels and other socio-economic characteristics of farm workers, and thus lead not only to increasing the amount of information about them but also to the growth of labour inspection in agriculture. Further, the growth in the size of individual farm operations and the tendency towards farmstead mechanization will increase the demand for skilled hired labour. All these influences should upgrade the status of farm workers in the occupational hierarchy.

ACKNOWLEDGMENTS

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VOLUME 4

NUMBER 3

AUGUST 1969

CANADIAN FARM ECONOMICS

Government
Publications

- Expected Patterns and Practices in Agriculture in 1980 G. R. Purnell, A. B. Andarawewa, R. A. Stutt 1
- A Review of the World Grain Situation 11
- Notes on Coarse Grain Production and Marketing in Canada G. G. Pearson and G. A. Hiscocks 19
- The Grain Delivery Quota System of the Canadian Wheat Board 21
- The Changing Pattern of Turkey Marketings in Canada J. D. F. Kidd 24
- Policy and Program Developments 29
- Publications 29

HON. H. A. OLSON, MINISTER—S. B. WILLIAMS, DEPUTY MINISTER

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CANADIAN FARM ECONOMICS

EXPECTED PATTERNS AND PRACTICES IN AGRICULTURE IN 1980

G. R. Purnell, A.B. Andarawewa, R.A. Stutt

The purpose of this paper is to provide a general view of the patterns and practices that are expected to be characteristic of Canadian agriculture in 1980. Future patterns and practices are assumed to be determined by their past trends. This, of course, implies that the factors which determine the patterns and practices have continuation of the past relationships in the future and hence predictable rates of growth. Changes in technology, in government programs and policies and in the international supply, demand and trade situation would lead to variations in these factors. It is difficult to quantify such changes for analytical purposes. During the past few years, changes in Canadian agriculture have occurred at an accelerated pace. Change is a basic ingredient of growth and as in the case of agriculture when growth rates are high, changes are spectacular. The longer the projected period, the greater will be the rate of change in the variables studied, thus affecting the accuracy of the projections.

GENERAL ECONOMIC AND DEMOGRAPHIC CHANGES TO 1980

Changes in Population and in the Economy

The Canadian population in 1980 is estimated at 26 million, an increase of 33 per cent over the average population during the period 1964-66 (Table 1), and 28 per cent over that of 1967 (1). Eight out of 10 persons will live in urban areas with 6 of them in large cities of 100,000 and over (2). In 1966, 72 per cent of the total population were located in urban areas.

Significant increases are expected in the gross national product and disposable income, both total and per capita. Per capita income in 1957 dollars is estimated to increase to \$3,466 from \$2,273 in 1964-66. Total food expenditure is estimated to increase 83 per cent from \$6.2 billion in 1964-66 to \$11.3 billion in 1980. As a proportion of disposable income, food expenditure will decrease from 20 per cent to 18 per cent. The increase in total food

expenditure does not necessarily mean a proportionate increase in the quantities of food consumed. The farm value of food as a proportion of retail value declined from 59 per cent in 1949 to 45 per cent in 1966 (3). Hence, a major part of this increase in food expenditures in 1980, will be accounted for by increased marketing costs, larger use of convenience foods involving more packaging, processing and freezing, and to a lesser extent by the shift to higher valued food such as meats, fruits and vegetables.

Importance of Agriculture in the Economy

The relative importance of agriculture in the economy is expected to continue to decline in terms of its share of total population, G.N.P., employment and trade (Table 2).

Rural population has declined from 46.3 per cent of the total population in 1930 to 28 per cent in 1966, and is expected to decline to 19 per cent by 1980. Similarly, the proportion of the population living on farms is estimated to decline from about 10 per cent in 1966 to 6 per cent in 1980. The contribution of agriculture to G.N.P. has increased from \$628 million in 1930 to about \$2,500 million in 1967, and is estimated to increase to about \$4,800 million by 1980. However, as a per cent of total G.N.P., agriculture has declined from about 11 per cent in 1930, to about 5 per cent in 1967, and will be about 3 per cent in 1980. The agricultural labor force has declined and will continue to decline, both totally and in proportion of the total labor force. It is estimated to decline from 559,000 (7.6 per cent) in 1967 to about 386,000 (4 per cent) by 1980.

Agricultural exports and imports, although in proportion of total exports and imports have declined, have continued to increase in absolute values. Agricultural exports are estimated at \$2 billion in 1980. No estimates are available to enable computation of proportionate shares. The changes and varia-

CORRECTION

Volume 4, Number 2, June 1969

Page 31, left column, paragraph 5, line 2 should read "In 1966, there were 126,983 hired farm workers . . ."

TABLE 1—CANADA: POPULATION AND INCOME, SELECTED PERIODS AND PROJECTIONS FOR 1980

	1949-51	1959-61	1964-66	1980	1980 1964-66
			thousand		per cent
June 1					
Population.....	13,722.6	17,863.6	19,649.6	26,050	132.6
Labour Force.....	5,147	6,391	7,165	10,698	149.3
			billion dollars		
1957 Constant dollars					
Gross National Product.....	23.1	34.2	44.6	90.3	202.1
Disposable income.....	15.4	23.8	39.0	62.9	203.8
Expenditure on goods and services.....	14.3	22.4	28.4	57.8	203.5
Expenditure on food.....	37.5	5.5	6.2	11.3	182.5
			dollars		
Per capita:					
Gross National Product.....	1,682	1,916	2,273	3,466	152.5
Disposable income.....	1,126	1,333	1,569	2,415	153.9
Expenditure on goods and services.....	1,042	1,254	1,445	2,219	153.6
Expenditure on food.....	260	307	316	434	137.3
			per cent		
Food as a per cent of disposable income.....	23.1	23.0	20.0	18.0	

Source: *Demand-Supply Projections for Canadian Agriculture—1980*, Economics Branch, Canada Department of Agriculture, Ottawa, June 1968.

TABLE 2—AGRICULTURE IN THE CANADIAN ECONOMY, SELECTED YEARS AND PROJECTIONS FOR 1980

	1930	1940	1950	1960	1967	1980 ^a
Rural population as a per cent of total population ^b	46.3	43.5	38.4	30	28	19
Farm population as a per cent of total population ^b	31.7	27.4	20.8	11.7	9.8	6
Agriculture in Gross National Product (million dollars) ^c	628	693	1,716	1,745	2,479	4,792
Agriculture as a per cent of Gross National Product.....	10.9	10.3	9.5	4.8	4.6	3.0
Agricultural labor force (thousands).....	1,238	1,344	1,018	683	559	386
Agricultural labor force as a per cent of total labor force.....	33.6	32.2	20.7	11.3	7.6	4
Agricultural exports (million dollars) ^d	692	780	938	1,147	1,483	2,000 ^e
Agricultural exports as a per cent of total exports.....	43.3	33.0	32.5	26.8	13.3	—
Agricultural imports (million dollars) ^d	402	389	483	810	1,083	—
Agricultural imports as a per cent of total imports.....	22.1	20.0	16.8	17.1	9.8	—

^a Projections for 1980 except for population are based on compound growth rates for 1962-67. Population living on farms is projected on 1961-66 rate of change. Rural population in 1980 is an estimate of the Economic Council of Canada (2).

^b Population figures are for the Census years 1931, 1941, 1951, 1961 and 1966.

^c Values in current dollars.

^d Values at 1948 prices.

^e Values in 1957 dollars.

Sources: (1) *Canada Year Book*, 1940, 1951, Dominion Bureau of Statistics.

(2) *Census of Canada, (Agriculture)*, 1951, 1961, 1966, Dominion Bureau of Statistics.

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tions in the economic and other characteristics which have been discussed above, will influence the patterns and practices in Canadian agriculture through their effects on the demand for agricultural products, both for domestic use and for exports.

Disposal of Agricultural Products

Domestic Food Consumption—Per capita food consumption has remained relatively stable during the last two decades. However, there have been significant shifts among the major food groups. Consumption of meat, poultry and fish has risen steadily from 129.8 pounds per capita in 1949-51 to 149.3 pounds per capita in 1964-66, as a result of the modest increases in beef consumption and the spectacular increase in poultry consumption which offset the decreases in the consumption of pork, veal and fish. Consumption of eggs increased from 29.5 pounds in 1949 to 37.5 pounds in 1957, and has declined to 31.7 pounds per capita in 1964-66.

Consumption of dairy products declined from 450.6 pounds per capita in 1949-51 to 384.6 pounds in 1964-66. Per capita consumption of butter, fluid milk and cream, and evaporated whole milk declined, while cheese, ice cream, and skim milk consumption increased. This decline in the consumption of dairy products may be, partly, explained by consumer preference for products of vegetable origin, price differentials and the availability of an array of substitutes for milk products. Fats and oils of animal origin also declined significantly for similar reasons.

Per capita consumption of fruits and vegetables, and fats and oils of vegetable origin showed a marked upward trend between 1949-51 and 1964-66. There was a shift towards the consumption of processed vegetables and fruits. Citrus and semi-tropical varieties of fruits and off-season fruits and vegetables constitute a substantial proportion of the demand for fruits and vegetables. Imports of these commodities increased from 18.4 per cent of total agricultural imports in 1959-61 to 27 per cent in 1964-66. Per capita consumption of cereals and potatoes have also declined—the latter due to a decline in consumption of wheat flour while the former was mainly due to a decline in consumption of fresh potatoes. However, the recent upward trend in the consumption of processed potatoes (chips, frozen, etc.) is expected to level off the downward trend in per capita consumption of potatoes. In 1966, 55 per cent of total food consumption was constituted of products of crop origin and 45 per cent of products of animal origin.

Projections of per capita food consumption in 1980 are based on coefficients of income elasticity of demand and rates of population growth. They

reflect the effect of rising incomes on certain types of food products. Increases in per capita consumption of meats, poultry, fruits, vegetables, and fats and oils are expected, but consumption of cereals, dairy products and eggs is expected to decrease. Within the group of dairy products, consumption of cheese and concentrated milk by-products such as condensed skim milk and evaporated skim milk show marked increases. No change is projected for sugars and syrups.

Total food consumption is estimated to increase 33 per cent by 1980. This shows the effect of per capita consumption and population increase. Large increases in total consumption occur in commodities which indicate an upward trend in per capita consumption. For example, the per capita consumption of meat in 1980 is 112 per cent of that of 1964-66 while total consumption of meat is increased by 49 per cent. Among those food groups that show a decline in per capita consumption, the increase in population will be sufficient to increase the total amount consumed in 1980. The only exception is butter which is expected to decline both in terms of per capita and total consumption.

Exports of Food Products—Exports are an important factor in the production and marketing of several agricultural commodities. Wheat exports constitute about 60 per cent of total production. In the case of rye, flaxseed, maple products and wool, exports constitute from one-third to two-thirds of total domestic production. Exports are important in the production of barley, soybeans and products, tobacco, cattle, cheese, skim milk powder, and apples. Practically the total production of whole skim milk powder is shipped abroad.

In 1967, agricultural exports constituted 13 per cent (\$1,483 million) of total exports. Although there has been no marked change in the composition of the commodity basket, there have been noticeable changes in the proportions of commodities exported. The relative proportions of grains, oilseeds, forage crop seeds and tobacco have increased, live animal exports have remained constant and grain products, meats, dairy products, and fruits and nuts have declined (4, Table 9). There have been changes in Canada's share of the world's trade in agricultural products. Although Canadian wheat exports increased from 8,846 thousand metric tons in 1951-53 to 12,061 thousand metric tons in 1963-65, her share of the world's wheat trade dropped from 37.8 per cent to 25.1 per cent for the relevant period (5). Significant increases in the share of world trade have occurred in linseed, tobacco and milk powder.

There has also been a shift in the direction of the flow of Canada's trade. The bulk of trade has been

TABLE 3—NUMBER OF FARMS BY ECONOMIC CLASS, CANADA, SELECTED CENSUS YEARS AND PROJECTIONS FOR 1980

Annual Sales per Farm	1951			1961			1966			1980 ^a	
	Number	Per Cent of all Farms	Per Cent of all Sales	Number	Per Cent of all Farms	Per Cent of all Sales	Number	Per Cent of all Farms	Per Cent of all Sales	Number	Per Cent of all Farms
Commercial farms ^a	235,090	38	78	259,037	54	90	276,835	64	95	252,248	80
\$10,000 and over	21,243	4	22	48,841	10	45	95,032	22	65	189,186	60
\$ 5,000 to \$ 9,999	69,019	11	27	90,419	19	27	96,856	22	21	47,296	15
\$ 2,500 to \$ 4,999	144,828	23	29	118,777	25	18	84,947	20	9	15,765	5
Small scale farms ^b	387,309	62	22	221,052	46	10	152,910	36	5	63,062	20
All farms ^c	623,091	100	100	480,903	100	100	430,522	100	100	315,310	100
Part-time farms ^d	65,135	10.4	—	37,645	7.8	1.0	129,565	30	18	—	—

^a Farms with annual sales of \$2,500 and over.

^b Farms with annual sales of less than \$2,500.

^c Includes institutional farms.

^d In 1951 and 1961, part-time farmers were defined as those with sales of agricultural products between \$250 and \$1,199 and (i) where the operator reported 100 or more days of off-farm work or (ii) where the operator reported farm income was less than his income from all other sources. In 1966, the definition was changed to those who received \$750 or more from off-farm work during the previous year or to those who received less than \$750 from off-farm work but worked 75 days or more off his farm.

^e Projections for 1980: number of all farms based on annual rate of change of 2.2 per cent during 1961-66. The number in each class based on the assumed arbitrary proportions of farming in each class to total.

Source: *Census of Canada, (Agriculture)*, 1951, 1961, 1966, Dominion Bureau of Statistics.

with the developed countries. The European Economic Community, United Kingdom, United States, Japan and the Communist group of countries including China purchased 83.5 per cent and 84.2 per cent of Canadian exports in 1959-61 and 1964-66 respectively. However, exports to the E.E.C., U.S.A., U.K. and Japan declined from 75.6 per cent in 1959-61 to 54.5 per cent in 1964-66, while those to the Communist group increased from 16.5 per cent to 29.7 per cent. The underdeveloped countries, at the present time, do not present major commercial outlets (4).

Projected exports in 1980 are based on the assumption of 1.7 per cent annual increase in the total volume of agricultural exports and implicitly on the continuation of the post-war trends for the next 12 years (1). Agricultural exports are estimated to be about \$2 billion in 1980, one-third greater than in 1964-66. Wheat will continue to dominate the market with 25 per cent above the 1964-66 average but with a decline in its share of total exports. Oilseeds, fruits and vegetables, tobacco, and animals and meats are estimated to increase both in terms of proportions to total exports and in absolute values, while other grains and grain products, and dairy products are expected to decline. Animals and meats are in terms of the North American market—this expansion is

mainly in feeder cattle and high quality dairy cattle. The trend in exports (except for wheat and a few minor products) is for a larger market.

CHANGES IN AGRICULTURAL ORGANIZATION

As noted earlier, projections in this paper are based on past trends and on the assumption that these trends and the relationships underlying these trends will continue to 1980. The figures given below are thought to be conservative.

Number of Farms by Economic Class

The number of farms in Canada decreased at the rate of about 10,600 a year between the Census years 1961 and 1966 (Table 3). Most of the decreases were in the lower economic classes as defined in the Census in terms of the value of products sold during the year. The total number of farms declined during 1961-66 at an annual rate of 2.2 per cent, small scale farms declined at the rate of 7.1 per cent, farms with sales of \$2,500 to \$4,999 at 6.4 per cent a year, and farms with sales of \$5,000 to \$9,999, and those \$10,000 and over increased at annual rates of 1.3 per cent and 14.1 per cent respectively. Assuming the rate of decline between 1961-66 to continue, the

TABLE 4—AVERAGE SIZE OF FARMS, CANADA, SELECTED CENSUS YEARS AND PROJECTIONS FOR 1980

	1941	1951	1961	1966	1980 ^a
Acres per farm					
All farms.....	237	279	359	404	560
Commercial farms.....	—	353	487	512	600
Small scale farms.....	—	214	209	171	100
Per cent of all farms					
Under 50 acres.....	15	14	11	12	—
Under 100 acres.....	37	34	27	26	—
Over 300 acres.....	37	22	34	42	—
Over 640 acres.....	7	10	15	18	—

^aBased on annual rates of change 1961-66; all farms 2.4 per cent; commercial farms 1.0 per cent; small scale farms —3.9 per cent.

Source: *Census of Canada, (Agriculture)*, 1951, 1961, 1966, Dominion Bureau of Statistics.

total number of farms is estimated to be about 315,310 in 1980.

Farms move from one economic class to another due to inflation and to increase in quantities of products sold. Commercial farms as a proportion of all farms increased significantly from 38 per cent in 1951 to 54 per cent in 1961 and to 64 per cent in 1966 and are assumed to constitute 80 per cent of all farms by 1980. More remarkable has been the increase in the proportion of farms in the high sales brackets.

In 1966, 95 per cent of the industry's sales were made by commercial farms, with 65 per cent coming from farms with sales of \$10,000 and over. The share of sales of farms with sales of \$5,000 to \$9,999 decreased from 27 per cent in 1951 to 21 per cent in 1966 and that of farms with sales of \$2,500 to \$4,999 decreased from 29 per cent in 1951 to 9 per cent in 1966. No estimates have been made on the

distribution of sales by class of farms in 1980 but on the basis of present trends it will be possible to produce the food requirements with fewer farms, the majority of which will be concentrated in the highest sales brackets.

Size of Farms

The size of farms is not determined by acreage only but by the magnitude of other inputs used and by sales volume. In the previous section, the growth of farms with large volume of sales was discussed. In this section the growth in size of farms in terms of acreage and other inputs is examined.

The average size of all farms increased from 279 acres in 1951, to 359 acres in 1961, and to 404 acres in 1966 (Table 4). The average size of a commercial farm had increased to 512 acres by 1966, and that of a small scale farm had declined from 209 acres

TABLE 5—RESOURCE USE IN CANADIAN AGRICULTURE, SELECTED YEARS AND PROJECTIONS FOR 1980

	1941	1951	1961	1966	Average Rate of Growth 1961-66	1980 ^a
numbers						
Acres per farm.....	237	279	359	404	2.4	560
Acres per farm worker.....	142	185	253	320	4.8	6.6
Workers per farm.....	1.6	1.5	1.4	1.2	-3.0	.8
dollars						
Capital per farm.....	9,558	12,694	18,310	21,302	3.1	32,662
Capital per farm worker.....	5,740	8,423	12,930	16,858	5.5	35,673
Capital per acre.....	40.4	45.4	51.0	52.7	.7	58.1
Machinery investment per farm.....	1,180	2,627	4,069	4,256	.9	4,825
Machinery investment per worker.....	707	1,743	2,281	3,368	8.1	10,021
Machinery investment per acre.....	4.9	9.4	9.0	10.5	9.0	16.1
Operating expenses per farm.....	1,139	1,738	2,544	3,412	6.1	7,817
Operating expenses per worker.....	682	1,153	1,797	2,700	8.5	8,460
Operating expenses per acre.....	4.8	6.2	7.1	8.4	3.4	13.4

^a Projections based on average annual rates of change, 1961-66. All values in constant 1949 dollars.

Sources: (1) *Census of Canada, (Agriculture)*, 1951, 1961, 1966, Dominion Bureau of Statistics.

(2) Unpublished data, Economics Branch, Canada Department of Agriculture.

TABLE 6—COMMERCIAL FARMS: NUMBER AND VALUE OF PRODUCTS SOLD BY PRODUCT TYPE, CANADA, 1961, 1966

	1961		1966	
	Number	Value*	Number	Value*
	per cent of total			
Dairy.....	21.0	15.5	20.4	12.6
Cattle, hogs and sheep excluding dairy farms.....	24.6	22.3	25.6	22.9
Poultry.....	3.2	5.9	2.3	5.7
Wheat.....	22.5	21.6	25.8	27.6
Small grains, excluding wheat farms.....	9.7	9.9	10.8	11.3
Field crops other than small grains.....	3.3	8.2	3.5	7.5
Fruits and vegetables.....	2.8	4.9	2.7	3.6
Forestry.....	0.3	0.3	0.2	0.1
Miscellaneous specialty.....	1.0	2.5	1.2	3.0
Mixed.....	11.6	8.9	7.5	5.7
Livestock combination.....	8.0	5.8	4.8	3.3
Field crop combination.....	1.7	1.4	1.1	1.0
Other combination.....	1.9	1.7	1.6	1.4
All farms.....	100.0	100.0	100.0	100.0

* In 1935-39 dollars—The relevant Wholesale Price Indexes of Canadian Farm Products were used as deflators.
Source: *Census of Canada, (Agriculture)*, 1961, 1966, Dominion Bureau of Statistics.

in 1961 to 171 acres in 1966. Assuming the rates of change for these 3 categories of farms to continue, the average size of all farms, commercial farms and small scale farms in 1980, is estimated at 555 acres, 600 acres and 100 acres respectively. The proportion of farms of relatively small size has declined. Farms, 50 acres or less declined from 15 per cent of total farms in 1941 to 12 per cent in 1966. Those less than 100 acres in size declined significantly from 37 per cent to 26 per cent during the same period. At the same time, farms with 640 acres or more increased 2.5 times from 7 per cent to 18 per cent in 1966.

Along with the increase in farm acreage there were increases in the size of other input categories. In Table 5, resource use per farm, per acre and per worker is presented. It indicates the simultaneous growth of all farm inputs with the exception of labor which has declined. Note should be made that the rates of change have been reduced in the later periods in most of the input categories. The annual rates of change are highest for resource use per worker indicating the sharp decline in the labor force. Projections have been made on the basis of 1961-66 rates of growth. On a per farm basis, sharp increases are noted in total capital, and operating expenses. Capital per farm is estimated to increase 53 per cent, from \$21,302 in 1966 to \$32,662 in 1980 (in 1949 dollars). Similarly operating expenses are estimated to increase from \$3,412 to \$7,817 during the same period.

As a measure of the composition of output, the value of products sold by farms of various product types is used. The data on sales of products by type of farm are available only for commercial farms which in 1961 and 1966 sold 90 per cent and 95 per

cent of all industry sales (Table 6). Wheat, small grains, field crops, and fruit and vegetable farms constituted about 45 per cent of all farms in 1961, which increased to 46.4 per cent in 1966. Cattle, hogs and sheep farms, dairy farms and poultry farms decreased from about 44 per cent in 1961 to 41.2 per cent in 1966.

No estimates are made for 1980 on value of types of products sold but total production projections have been made on the basis of 1949-66 trends (1). Wheat production is estimated to be 868 million bushels in 1980, which would exceed total domestic and foreign demand by about 87 million bushels assuming low feeding rates. Total coarse grains production is projected to increase to one billion bushels, again on the basis of increased yield and acreage. Increased yields are projected for corn, oats and barley—the largest increase in acreage (77 per cent) will be in corn followed by barley. The acreage under oats is expected to continue to decline. Buckwheat production is expected to be lower than in 1964-66, while corn production is expected to increase by 120 per cent. However, domestic requirements of corn are projected to increase at a higher rate than production resulting in a deficit. Requirements of coarse grains are projected on the basis of two different rates of feeding. Assuming only a slight increase in the amount of grains consumed per animal unit, then production of total coarse grains may be in excess of total domestic and foreign demand, but with a marked increase in feed requirement per animal unit, the deficit in coarse grains might be about 16 million bushels. Total grains, however, are projected to be in excess of total demand by 47 million to 140

million bushels in 1980. The production of rapeseed and flaxseed depends on export potential and is projected to increase by 100 and 40 per cent respectively.

In livestock production, veal and beef production show significant increases and is sufficient to cover domestic requirements. The exportable surplus of pork will be greatly reduced. Mutton and lamb production is projected to cover 10 per cent of domestic demand. Poultry and egg production is projected to be slightly more than domestic requirements. Milk production in 1980, based on an increased yield to 8,500 pounds per cow and a lower number of cows than in 1964-66 is estimated at 19.9 billion pounds, which is slightly less than total estimated demand.

The increase in production of livestock products implies an increase in number of animals on farms and an increase in the derived demand for feed grains. In 1980, cattle requirements for meat will be 52 per cent higher, hogs 40 per cent, and poultry about 69 per cent (7). Layers and milk cows are projected to decrease by 5 per cent and by about 17 per cent respectively, due to the declining demand for eggs and milk, and higher productivity per animal.

Assuming trends in post-war feeding rates to continue (i.e., 0.85 tons per grain consuming animal unit in 1980) total feed grain requirements are projected to increase to 18.8 million tons (30 per cent) in 1980 from 14.5 million tons in 1964-66. On an increased requirement (i.e., 0.95 tons per grain consuming animal unit), the increase is estimated at 45 per cent, requiring 21 million tons in 1980.

In the composition of feed grains, corn, barley, mixed grains and oats increased, and wheat and buckwheat declined during the period from 1949-51 to 1964-66. Corn increased from 3 per cent of total feed grains fed in 1949-51 to 12 per cent in 1964-66. Barley increased from 20 to 25 per cent. It is projected that corn and barley will contribute about 50 per cent of total feed grain fed in 1980.

In 1980, feed grain requirements could range between 860 million and 960 million bushels—160 million to 200 million bushels higher than in 1964-66. In 1964-66, grain used for feed for livestock was 48 per cent of total production. If wheat is excluded, 86 per cent of the total production of other coarse grains was utilized for feed. Production projections for 1980 indicate that, assuming lower feeding rates, total coarse grain production in 1980 will be sufficient to cover feed requirements. On a higher feeding rate, there would be a deficit of about 16 million bushels which could be met by the use of wheat for feed.

The composition of agricultural production in

1980 is not expected to change significantly from that of today. However the proportion of the various crop and livestock products in the total product will change. Further, the trend towards specialization will be reinforced both among farms and among the regions in Canada. Among crop products, slight increases in the proportion of wheat, feed grains and tobacco can be expected. Buckwheat production is expected to decline absolutely and proportionately. For Canada as a whole, livestock products are estimated to increase their share of total product. The proportion of cash receipts from the sale of livestock products will continue to increase both as a result of the increase in share of total product and the increase in livestock prices relative to those of crop products.

Within the livestock industry, the cattle population is expected to grow. Milk cow numbers for milking purposes will decline and beef numbers increase at the same or accelerated rates that exist currently. Dairy production will be centralized along with human population, with the centre probably located in Quebec. The Maritimes and Quebec will have increased feeding of cattle. In Manitoba and Saskatchewan, cattle numbers will increase but crop production will continue to be relatively profitable. The cattle industry will grow at a slower rate in Alberta and British Columbia but this area will experience the largest absolute growth (6).

Composition of Inputs

During the process of economic growth, the mix of inputs used in production changes significantly. Similarly, there have been marked shifts in the proportion of inputs used in agricultural production in Canada. Changes in the relative prices of these factors, developments in agricultural technology and developments in the non-farm sector which have increased the supply elasticity of non-farm factors, have made it economical to make substitutions among various inputs. The increase in the price of labor relative to the real price of capital has increased the substitution of capital for labor. Further, greater specialization of farm production has led to a larger proportion of inputs being purchased from off-farm sources.

Land and buildings have remained more or less constant. They constituted 22 per cent of total inputs in 1941 and 23 per cent in 1966 (Table 7). Labor declined at an annual rate of 1.5 per cent during 1947-67. It constituted 57 per cent in 1941 and decreased to 24 per cent in 1966. Machinery and equipment, seed and feed, fertilizer and other inputs have all increased in relative proportions. The

largest rate of increase was in fertilizer and lime followed by other capital inputs, such as pesticides, electric power, feed and seed. Total capital inputs increased from 21 per cent in 1941 to 53 per cent in 1966.

Projections of the input mix have been made on the basis of the rate of change during 1947-67. In 1980, labor should constitute only 15 per cent of total inputs. Land and buildings are estimated to increase to 24 per cent. It should be noted that much of the increase in the input category of land and buildings has been from the value of the buildings and improvements to land and buildings, and there has been no increase in total acreage under farms in Canada. Machinery and equipment is estimated to be 25 per cent of total inputs, fertilizer 5 per cent, feed and seed 18 per cent, and other inputs 13 per cent. Capital inputs in 1980 will constitute 61 per cent of total inputs compared with 53 per cent in 1966.

Total capital increased 25 per cent from 1949 to 1967. The greatest increase was in livestock (51 per cent), followed by machinery (37 per cent). Real estate increased by only 14 per cent during the period (5). Although significant increases in capital investments are not expected to 1980, (Table 5), investment per farm will increase due to the decline in the number of farms and hence lead to larger size farms. Capital per farm in 1980, in 1949 dollars, was estimated at \$33,000, which in current dollars would be in the range of \$60,000 to \$70,000.

Productivity of Agriculture

Although there have been, as indicated in the preceding section, significant shifts in the proportions of inputs, total inputs used have remained stable or declined slightly. At the same time, output

has increased tremendously, and hence, total agricultural productivity has risen sharply. Indexes indicate that output and productivity have increased sharply. In 1965, the index of output was 161 (1949=100), the input index was 98 and the productivity index was 165 (7). These trends in productivity are expected to increase in the future.

Other Changes

Another change in agriculture in recent decades and one that will continue is part-time farming. Part-time farmers include multiple job-holders, those who seek jobs out of agriculture for economic reasons, and some who are semi-retired. The number of such farmers has increased from 10.4 per cent of all farmers in 1951 to 30 per cent in 1966 (Table 3). However, a part of the increase is due to the change in the census definitions of a farm and a part-time farm. More significant is the number of off-farm workers. In 1966, nearly 39 per cent of all farmers worked off their farms at sometime or other during the year, 18.4 per cent worked for more than 127 days off their farms and 11 per cent worked for more than 229 days. An important factor in off-farm work is the pull of the non-farm economy. Although no data are available on the off-farm incomes of part-time operators, the 1958 Farm Family Expenditures Survey found that 75 per cent of the family income of non-commercial farms in Canada came from off-farm sources (8).

The family farm will continue to be the dominant farm organization in 1980. But although the family will supply the labor resource, more services will be rented including land. Due to capital restrictions, farmers who need additional land have begun increasingly to rent the land. Part-owners-part-tenants increased from about 12 per cent in 1941 to

TABLE 7—DISTRIBUTION OF INPUT USE BY CATEGORIES IN CANADIAN AGRICULTURE, SELECTED YEARS AND PROJECTIONS FOR 1980 (1949 DOLLARS)

	1941	1951	1961	1966	1980*	Annual Rates of Changes 1947-67
per cent of total inputs						
Land and buildings.....	22	20	23	23	24	.39
Labor.....	57	45	33	24	15	-1.5
Machinery and equipment.....	11	18	20	22	25	.83
Purchased feed and seed.....	6	9	13	17	18	1.2
Fertilizer and limestone.....	—	1	2	4	5	2.4
Other inputs ^b	4	7	9	10	13	1.6
Total.....	100	100	100	100	100	—

* Projections for 1980 based on linear trends.

^b Other inputs include livestock expenses, pesticides, insurance, irrigation, custom work, electricity and other miscellaneous items.

Source: Unpublished data, Economics Branch, Canada Department of Agriculture.

about 23 per cent of all farmers in 1966, while full owners declined from about 76 per cent to about 73 per cent. Much more significant, the proportion of land held by part-owners increased from 28 per cent to 44 per cent during the same period, while that of full owners declined from 57 per cent to 52 per cent. The increase of part-ownerships which will in turn increase the proportion of rented land will continue in the future, along with greater use of custom work, and hiring of such functions as spraying, dusting and fertilizing.

Vertical integration which limits the scope of the managerial functions of farmers has not become widespread in all areas of production and marketing. An estimate was made, in 1966, on the extent of vertical integration in the poultry industry (9). Complete owner integration had not been established although contract integration covered about three-quarters of the growers in Canada, with about 90 per cent for Ontario. No data were available on the extent of contract integration in feeder cattle. The extent of integration is not expected to increase by 1980. There will be, however, an increase due to labor, capital and managerial requirements of both family and non-family partnerships, and non-family corporate farms.

It has been predicted that by 1980 farmers will be using more complex machinery, purchasing a larger proportion of farm inputs from non-farm sources and in general be running a fairly complicated business organization. These developments will require that farmers have a knowledge of financial analysis, law, programming and budgeting in addition to technical know-how. Efforts have to be directed towards increasing the managerial abilities of farmers. Extension, education and training of farmers will receive increased attention. Computer analysis of farm businesses will be available to farmers and should enhance their managerial abilities.

There is little information available on the levels of education or other levels of competence of Canadian farmers. In general, the median years of schooling of all farmers and farm laborers increased from 6.9 years in 1951 to only 7.2 years in 1961. The percentage increase was 4.3 per cent compared with 12.3 per cent for all occupations during the period (10). Only 32 per cent of male farmers had more than elementary education. It could be, of course, argued that the minute percentage of college graduates in agriculture will gradually increase and form the bulk of progressive farmers. But, on the other hand, when brain power is replacing brawn power, agriculture in the future is entering an era of having computers, etc. with the bulk of the farmers having only elemen-

tary education. Consideration must also be given to the existence of a knowledge application gap among farmers.

SUMMARY AND CONCLUSIONS

This paper examined the past trends in patterns and practices in Canadian agriculture and explored their status in 1980. The projections were for the most part based on the rates of change of the various farm characteristics during the post-war period; and hence, their relevance depends on the continuation of these growth rates. In brief, the analysis indicated fewer but larger farms, the continuation of the family farm as the predominant production unit, more of the production inputs will be purchased from off-farm sources, and more of the fixed inputs including land and machinery will be rented, rather than owned by the farmers, mainly due to capital restrictions.

With regard to machinery, the trend towards larger machines is continued and emphasis is shifted to the mechanization of specialty crops. Much of the investment in machinery will be in the form of replacement of old machines with those of higher performance and quality. With greater contact with non-agricultural sectors, with greater use of capital, the managerial abilities of farmers will be greatly strained. The computerized farm accounting project which will be available in all provinces by 1970 will help to increase to flow of information to farmers.

As agricultural growth is a continuous process, the characteristics of agriculture that will be widespread in two decades, are already with us in a minute form. The fundamental problem is that policymakers and researchers should be aware of these changes and so direct their thoughts and activities. There are many such problem areas. As an example, there has been a tremendous growth in the use of chemicals in agriculture. Developments in the chemical industries will increase the areas of substitutability of chemicals for labor as well as machinery. However, the hazards of the use of chemicals have been given scant attention.

Secondly, of fundamental importance to all researchers is the growing cost of research. Research has become expensive in terms of the number of qualified people available, and in terms of the amount of money that can be spent on them and on other requirements such as computer time. There are many projects within a particular discipline as well as among disciplines that compete for a given amount of money as well as men.

Recently, the lag in yield technology of Canadian agriculture as compared with that of the United States

has been highlighted by the Economic Council of Canada (11). For example, in wheat, which accounts for about 40 per cent of Canadian cropland, yields were 15 per cent lower in Canada and the annual yield increase too was lower (0.13 bushels vs. 0.41 bushels) (12). On further analysis, the Council found that yield technology contributed only one-third as much as mechanization to labor productivity whereas in the United States, it contributed more than mechanization. Hence, compared with the United States, Canada has advanced in the area of mechanization but not kept pace with yield technology. At the same time, the returns per dollar of investment in mechanization although strong have declined while the returns for inputs related to yield technology, especially fertilizer have increased, and remain strong. No reasons have been adduced for the gap in yield technology but there is no doubt it should be reduced.

The Federal Task Force on Agriculture, in one of its position papers prepared for the Agricultural Congress in March 1969, pointed out the imbalance in the allocation of research funds in agriculture. In 1966, only 8.1 per cent of the funds spent on agricultural research in Canada was allocated to economics and sociology. Within the social sciences, it pointed out the small amount spent on marketing research. This allocation of resources in research is of concern at a time when the most pressing and important problems facing agriculture are related to low incomes and the reduction in Canadian export markets.

A serious examination of the adequacy of allocation of resources to research in crop technology in particular, and of the approaches of the current priorities given implicitly and explicitly to various areas of research in agriculture in general is essential. For this purpose in the future it would be necessary to evaluate in terms of costs and benefits each research area prior to allocation of funds. In the

Economics Branch, steps are now being taken to work out appropriate criteria and procedures for such evaluation.

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A REVIEW OF THE WORLD GRAIN SITUATION

In May 1969, representatives from 39 countries met in Rome for the 12th Session of the FAO Study Group on Grains and reviewed the current world grain situation and outlook for production, trade and prices. The review was based largely on statements by country delegates, the Executive Secretary of the International Wheat Council, and a draft document prepared by the Secretariats of the Food and Agriculture Organization and the International Wheat Council. In the latter part of June, 1969, delegates met in London for the 56th General Council Session of the International Wheat Council. The review of the world grain situation and outlook by the Executive Secretary of the IWC to the 56th Council Session was largely in accord with the earlier review made by the FAO Study Group on Grains. These reviews clearly portrayed the changes that have taken place in the international grain market during the past three years.

The following review is based on the work of the FAO Secretariat (I)

WHEAT

Production in 1968/69

World wheat production in 1968/69 is estimated at a record 306 million tons (2), 13 per cent more than in the previous year (Table 1). The greater part of the expansion was in exporting countries. The U.S.S.R. harvested the second largest wheat crop in its history, despite unfavorable weather. There were bumper crops in the United States, notwithstanding a reduction in the acreage, and in Australia where there was favorable weather and a record acreage.

Canadian production also rose, but it remained well below the 1966/67 level. Argentina had a below-average crop due to unfavorable weather. The most striking feature of production in importing countries was the sharp rise of 17 per cent in Asian wheat output (excluding China Mainland). This reflected a combination of favorable weather and the success obtained by improved farming techniques and the use of high-yielding varieties in India and Pakistan. African production also rose substantially, but adverse weather caused a decline in the Near East. In western Europe, production was only slightly below the record 1967/68 crop. Eastern Europe maintained its production at 20 million tons, notwithstanding drought, indicating the influence of improved growing techniques.

International Trade in 1968/69

According to available data, world wheat exports will fall by about 14 per cent in 1968/69 to approximately 45 million tons (excluding trade within the EEC, which is classified as internal marketings from 1 July 1967, when the unified grains market of the Community became fully operative). This will be the third successive decrease in international trade

TABLE 1—WORLD WHEAT PRODUCTION, PROVISIONAL ESTIMATES FOR 1968/69 AND COMPARATIVE DATA 1964/65 TO 1968/69

	1964/65	1965/66	1966/67	1967/68	1968/69 Provisional
	million tons				
Western Europe.....	46.9	48.6	44.5	51.9	51.7
EEC.....	29.3	30.5	26.5	31.3	32.2
Eastern Europe.....	14.4	18.6	18.1	20.4	20.4
U.S.S.R.....	74.4	59.7	100.5	77.3	96.2 ^a
North and Central America.....	53.4	55.1	59.9	59.9	62.6
Canada.....	16.3	17.7	22.5	16.1	17.7
United States.....	34.9	35.8	35.7	41.4	42.7
Mexico.....	2.1	1.6	1.6	2.3	2.2
South America.....	13.9	8.6	8.4	9.4	8.4 ^b
Argentina.....	11.3	6.2	6.2	7.3	5.9
Asia (excluding centrally planned countries).....	31.7	35.6	34.6	38.1	44.5 ^b
Near East.....	15.7	16.7	18.2	20.6	19.8 ^b
Far East.....	16.0	18.9	16.4	17.5	24.7 ^b
Africa.....	5.9	5.8	5.2	6.0	7.3 ^b
North of Sahara.....	4.2	4.5	4.0	4.2	5.4 ^b
Republic of South Africa.....	1.1	0.7	0.6	1.1	1.2
Oceania.....	10.3	7.4	13.0	8.0	15.0
Australia.....	10.0	7.1	12.7	7.6	14.6
World (excluding centrally planned countries).....	162.1	161.0	165.6	173.3	189.5 ^b
World (excluding Asian centrally planned countries).....	250.9	239.3	284.2	271.0	306.1 ^b

^a Information provided by FAO.

^b Estimate.

Source: International Wheat Council.

TABLE 2—WORLD WHEAT AND FLOUR EXPORTS, PRINCIPAL EXPORTERS, CROP YEARS 1964/65 TO 1968/69

Country	1964/65	1965/66	1966/67	1967/68	1968/69 Forecast
	million tons				
Argentina.....	4.4	7.9	3.1	1.4	2.8
Australia.....	6.5	5.7	7.0	7.0	6.0
Canada.....	11.9	14.8	14.8	8.9	8.0
EEC.....	6.1	6.3	4.7	5.6	4.0
U.S.A.....	19.6	23.4	20.2	20.4	14.6
U.S.S.R.....	1.2	2.2	4.1	5.1	5.3
Others.....	1.5	2.2	2.4	3.7	4.3-5.3
Total.....	51.2	62.5	56.3	52.1	45.0-46.0

Source: International Wheat Council.

since the record of 62 million tons reached in 1965/66 (Table 2).

The decrease in 1968/69 mainly reflects the fall of 4 to 5 million tons in the import requirements of India and Pakistan, and smaller purchases by the U.S.S.R. (Table 3). The better crops in Africa are also expected to reduce imports into this region. Japan's imports will probably be about the same, but trade to western Europe may increase moderately in view of the lower quality of the crop and stricter regulations for the use of durum in pasta production in Italy. South American imports may be higher in view of the droughts in Peru and Chile. Exports to Mainland China are expected to remain at about 4 million tons.

The peak level of trade of over 60 million tons recorded in the mid-sixties was mainly due to the large imports by the U.S.S.R., an exceptionally high level of import requirements in India and Pakistan, and increasing trade with China (Mainland). The continuing rise of grain production in the Soviet Union suggests that it may return to its traditional net export position and the success of the improved farming techniques and high-yielding wheat varieties in India and Pakistan point to a declining level of

import requirements in Asia. Trade with China (Mainland) no longer shows signs of growth.

This changed pattern of trade will result in lower shipments by most exporting countries, but the fall in imports of India and Pakistan will especially affect the trade of the U.S., particularly shipments under P.L. 480, while total Canadian commercial exports may be influenced by smaller shipments to the U.S.S.R. Argentina's exports are limited by the size of its crop; however, export revenue will be improved by the lower freight rates which can be obtained as a result of the improvements in port facilities. Australian exports have benefited from higher sales to Japan, reflecting the temporary embargo on purchases of U.S. wheat. New contracts were concluded with Mainland China by Australia, Canada and the EEC.

Prices in 1968/69

The expansion of supplies combined with lower demand has exerted a downward pressure on international market prices for wheat. Export prices which at the beginning of the crop year were about the minimum levels of the International Grains Arrangement, moved below these as the season

TABLE 3—WORLD EXPORTS OF WHEAT AND WHEAT FLOUR BY AREA OF DESTINATION, CROP YEARS 1964/65 TO 1968/69

Destination	1964/65	1965/66	1966/67	1967/68	1968/69 Forecast
	wheat equivalent: million tons				
Western Europe ^a	11.6	13.1	11.0	10.3	—
Eastern Europe and U.S.S.R.....	6.8	14.0	7.9	6.0	—
North, Central and South America.....	5.4	6.0	6.6	5.5	—
Asia (excluding Mainland China).....	17.4	17.8	18.6	19.4	—
China (Mainland).....	5.1	6.4	5.0	4.2	—
Africa.....	4.4	4.9	7.0	5.5	—
Oceania.....	0.3	0.3	0.2	0.1	—
Unspecified.....	0.2	0.1	0.1	0.2	—
World total.....	51.2	62.5	56.3	52.2	45.0-46.0

^a Includes intra-trade except for 1968/69.

Source: International Wheat Council.

TABLE 4—WHEAT: ESTIMATED SUPPLIES, TRADE^a AND UTILIZATION IN FIVE MAJOR EXPORTING COUNTRIES, 1964/65 TO 1968/69, (CROP YEAR OF EACH COUNTRY)

Country	1964/65	1965/66	1966/67	1967/68	1968/69 Forecast
million tons					
United States (July/June)					
Opening stocks.....	24.5	22.2	14.6	11.6	14.6
Production.....	34.9	35.8	35.7	41.4	42.7
Imports.....	—	—	—	—	—
Domestic use.....	17.5	19.9	18.5	17.7	20.9
Exports.....	19.7	23.6	20.2	20.7	14.6
Closing stocks.....	22.2	14.6	11.6	14.6	21.8
Canada (August/July)					
Opening stocks.....	12.5	13.9	11.4	15.7	18.2
Production.....	16.3	17.7	22.5	16.1	17.7
Imports.....	—	—	—	—	—
Domestic use.....	4.0	4.3	4.2	4.5	4.4
Exports.....	10.9	15.9	14.0	9.1	8.2
Closing stocks.....	13.9	11.4	15.7	18.2	23.1
Argentina (Dec./Nov.)					
Opening stocks.....	2.2	3.3	0.2	0.2	1.0
Production.....	11.3	6.1	6.2	7.3	5.9
Imports.....	—	—	0.1	—	—
Domestic use.....	3.7	3.7	4.1	4.3	—
Exports.....	6.4	5.5	2.2	2.3	—
Closing stocks.....	3.3	0.2	0.2	1.0	—
Australia (Dec./Nov.)					
Opening stocks.....	0.6	0.7	0.5	2.2	1.4
Production.....	10.0	7.1	12.7	7.6	14.6
Imports.....	—	—	—	—	—
Domestic use.....	2.6	2.5	2.4	2.7	3.0
Exports.....	7.3	4.8	8.5	5.7	5.5
Closing stocks.....	0.7	0.5	2.2	1.4	7.5
EEC (July/June)					
Opening stocks.....	6.1	5.6	6.8	5.4	7.6
Production.....	29.3	30.5	26.5	31.3	32.2
Imports ^b	3.5	4.2	4.3	3.6	3.9
Domestic use.....	27.7	27.7	27.6	27.9	—
Exports ^b	5.7	5.8	4.5	4.9	4.0
Closing stocks.....	5.6	6.8	5.4	7.6	—
Total Five Countries ^c					
Opening stocks.....	45.9	45.8	33.4	35.1	42.8
Production.....	101.9	97.1	103.7	103.8	113.1
Imports.....	3.6	4.3	4.5	3.7	3.9
Domestic use.....	55.6	58.1	56.9	57.1	61.5
Exports.....	49.9	55.7	49.5	42.7	40.0
Closing stocks.....	45.8	33.4	35.1	42.8	58.3
Total Seven Countries ^d					
Opening stocks.....	47.7	47.4	35.7	37.6	45.5
Production.....	106.9	102.6	109.1	110.5	119.5
Imports.....	3.7	4.4	4.5	3.7	3.9
Domestic use.....	60.6	62.8	61.9	62.3	67.1
Exports.....	50.3	55.9	49.8	44.1	40.6
Closing stocks.....	47.4	35.7	37.6	45.5	61.2

^a Includes wheat equivalent of wheat flour and in the case of the United States of certain wheat products.

^b Excluding intra-Community trade.

^c These may not add up exactly to the sum of the individual figures, as the totals have been calculated from unrounded figures.

^d Including Spain: June/May; Sweden: September/August.

Source: International Wheat Council.

advanced. Discussions have taken place in an effort to solve the present difficulties, and the members of the IGA have reiterated their confidence in the IGA as an instrument for stabilizing the international wheat market.

Outlook for 1969/70

Total opening stocks of 7 major exporters (excluding U.S.S.R.) in 1969/70 are expected to be about 61 million tons, substantially above those for 1968/69 (Table 4). This is only slightly below the peak level

of 1960/61 (63.6 million tons) and is close to the high average levels of the second half of the 1950's. With the exception of Argentina, all the principal exporting countries will have larger stocks than a year earlier.

While it is too early to form a clear picture of wheat production in 1969/70, some indications are apparent. In the United States the 13 per cent reduction in the national wheat acreage allotment is expected to result in a similar reduction in the harvested acreage. Present indications are that the crop will be 11 per cent less than in 1968/69. In Canada, according to farmers' planting intentions, the wheat acreage may be 12 per cent below last year. In Australia proposals to restrict deliveries to the Wheat Board to 357 million bushels (9.7 million tons) had been accepted by the Commonwealth and State Governments, but this is not expected to result in reduced acreage this year.

In western Europe protracted wintry weather hampered sowing. A smaller wheat acreage is expected in the U.K. In the Community, wheat production in France and Italy is expected to rise owing to higher yields, and in Germany the area is larger. In eastern Europe, Poland's wheat production shows a steadily rising trend, but Romania's output will be limited by a further fall in wheat acreage in 1969. In the U.S.S.R. weather conditions in the winter wheat

area were apparently more severe than usual, but with favorable growing conditions, some of the prospective losses might be recovered during the remainder of the season. The Indian wheat crop is expected to show a further advance on last year's record production, and Turkey's production is also likely to rise. Adverse weather conditions have affected output in Tunisia and Algeria, but in Kenya the likely effect on wheat production of bad weather and lower producer prices may be offset by the spread of higher-yielding varieties.

There are no indications to suggest that world trade in wheat in 1969/70 will differ greatly from the 1968/69 level, but much will depend on growing conditions in the main importing countries in the next few months. In this connection, it is noted that the world supply situation for rice, which is a preferred cereal in most of Asia, has eased considerably and that rice surpluses now exist in some countries.

COARSE GRAINS

Production in 1968

World production of coarse grains reached 490 million tons in 1968, only slightly less than the 1967 record (Table 5). In the developing countries, production was moderately larger in Asia and virtually unchanged in Africa, but it declined in Latin Ameri-

TABLE 5—WORLD COARSE GRAINS^a PRODUCTION, PROVISIONAL ESTIMATES FOR 1968 AND COMPARATIVE DATA, 1964 TO 1968

	1964	1965	1966	1967	1968 Provisional
	million tons				
Western Europe.....	66.8	66.1	70.5	77.8	78.9
EEC.....	30.6	30.1	31.9	37.0	37.7
Eastern Europe.....	34.6	35.3	38.2	37.9	38.7
U.S.S.R.....	65.3	53.2	61.9	59.8	64.4
North and Central America.....	146.0	170.2	172.7	187.2	183.0
Canada.....	11.9	14.4	15.9	13.7	16.5
United States.....	122.5	143.7	143.6	160.3	153.1
Mexico.....	9.2	9.7	10.7	10.7	10.7
South America.....	22.5	23.5	26.3	29.1	27.0
Argentina.....	9.3	7.4	10.9	12.0	10.1
Asia (excluding centrally planned countries).....	46.5	42.4	46.0	50.4	50.9
Near East.....	9.8	10.2	10.1	10.8	10.5
Far East.....	36.7	32.2	35.9	39.6	40.6
Africa.....	38.7	39.7	40.6	48.0	43.4
North of Sahara ^b	9.5	9.6	8.6	10.7	11.4
Republic of South Africa.....	4.7	5.1	5.5	10.7	5.6
Oceania.....	3.0	2.6	4.1	2.2	4.0
Australia.....	2.8	2.4	3.9	2.1	3.7
World (excluding centrally planned countries).....	323.5	344.5	360.2	394.8	387.2
World (excluding Asian centrally planned countries).....	423.4	433.0	460.3	492.5	490.3

^a Rye, barley, oats, corn, sorghum, millets and other grains.

^b Including U.A.R. and Sudan.

ca, reflecting mainly the smaller Argentine harvest. Aggregate coarse grain production in the developed countries was moderately lower due to the cutback in United States production, and the drought-reduced South African crop. The Canadian harvest was larger than in 1967, and production in western Europe slightly exceeded the high figure attained in the previous year. A better crop is also reported for the U.S.S.R., and over-all production in the centrally planned countries may have reached a new record.

Among individual grains, world corn production declined in 1968 after several years of uninterrupted growth, because of the reduction in U.S. production induced by changes in the feed grain program, and smaller harvests due to dry conditions in South Africa and in Argentina. At the same time, there was an over-all rise in barley production of almost 10 per cent, with larger crops in the main non-European exporting countries as well as in western European importing countries. The other feature of coarse grain production was a rise in oats output due to larger crops in North America and Australia. Sorghum production was smaller in the United States and the Republic of South Africa, but Argentina's production was larger; another good crop was harvested in India, so that there may have been little overall change in the world sorghum production.

International Trade in 1968/69

World exports of coarse grains in 1968/69 (July/

June season) may be close to 40 million tons, only slightly less than in the previous season and well above the 1963/65 average (Table 6). Shipments in the first nine months of the current season indicate that trade in corn may reach the record 1967/68 level, but another sharp fall is expected in sorghum exports and more moderate declines in barley, oats and rye. Sorghum sales continued to be hampered by an unfavorable relationship between prices of sorghum and those of corn, and exports of barley were limited by the excellent domestic crops in most importing countries. Imports of coarse grains are expected to be lower in the Federal Republic of Germany and Spain, and may show little change in the Netherlands. However, the barley crop declined in the U.K. and this both reduced its exports of barley and increased its imports of coarse grains. In Poland, imports of coarse grains increased due to larger takings of feed barley and of corn. Japan purchased more coarse grains in line with the upward trend in its livestock production and smaller domestic feed grain harvests.

Coarse grain shipments of the United States, the main exporter, will probably show a marked decline. During the first 9 months of the July/June season, U.S. shipments were approximately 20 per cent smaller than in the previous year, partly due to the prolonged dock strike in eastern ports, and partly reflecting increased competition by other exporters in the main markets. Exports of U.S. barley will be sharply reduced, sorghum shipments will be substan-

TABLE 6—WORLD TRADE IN COARSE GRAINS^a, CROP YEARS 1964/65 TO 1968/69

	1964/65	1965/66	1966/67	1967/68	1968/69 Forecast
million tons					
Exports					
Argentina.....	5.2	3.8	6.5	4.3	5.3
Australia.....	0.8	0.5	0.9	0.3	0.8
Brazil.....	0.0	0.6	0.6	1.4	1.4
Canada.....	1.1	1.2	1.3	1.2	0.8
France.....	2.9	2.8	3.8	4.1	4.2
South Africa, Republic of.....	0.7	0.3	0.7	3.4	2.6
United States.....	17.6	25.5	21.0	19.7	17.0
U.S.S.R. ^b	0.6	0.2	0.2	0.1	—
Eastern Europe ^b	0.8	0.5	0.6	0.7	—
Others.....	5.0	6.8	7.1	6.2	—
World ^b	34.7	42.2	42.7	41.4	39.40
Imports					
Western Europe.....	22.7	29.1	27.7	26.7	—
EEC.....	14.0	17.9	16.9	16.8	—
United Kingdom.....	3.9	4.3	4.1	4.1	—
Asia ^a	6.3	7.6	11.7	10.9	—
Japan.....	5.1	5.2	7.8	8.0	—
Eastern Europe ^b	1.2	1.8	1.2	0.8	—
Others.....	3.3	2.7	2.1	2.8	—
World ^b	33.5	41.2	42.7	41.2	39.40

^a Rye, barley, oats, corn, sorghum, millets and other grains.

^b Excluding trade within the centrally planned countries.

^c Excluding China (Mainland).

TABLE 7—COARSE GRAINS^a, ESTIMATED SUPPLIES, TRADE AND UTILIZATION IN FIVE EXPORTING COUNTRIES, 1964/65 TO 1968/69 (CROP YEAR OF EACH COUNTRY)

Countries	1964/65	1965/66	1966/67	1967/68	1968/69 Provisional
million tons					
United States ^b (July/June)					
Opening stocks.....	62.9	50.0	38.6	34.2	44.3
Production.....	122.4	143.7	143.6	160.3	153.1
Imports.....	0.5	0.3	0.3	0.2	0.2
Domestic use.....	116.1	128.8	128.2	129.2	140.8
Exports.....	19.7	26.6	20.1	21.2	17.0
Closing stocks.....	50.0	38.6	34.2	44.3	39.8
Canada (Aug./July)					
Opening stocks.....	5.6	4.3	4.6	4.9	4.4
Production.....	12.0	14.4	15.9	13.8	16.4
Imports.....	0.5	0.6	0.5	0.8	0.8
Domestic use.....	12.6	13.4	14.4	13.9	14.1
Exports.....	1.2	1.3	1.7	1.2	1.0
Closing stocks.....	4.3	4.6	4.9	4.4	6.5
Argentina ^c (Dec./Nov.)					
Opening stocks.....	0.3	0.5	0.1	0.6	1.4
Production.....	9.4	7.5	10.8	12.0	10.1
Imports.....	—	—	—	—	—
Domestic use.....	5.1	4.3	4.8	6.3	5.6
Exports.....	4.1	3.6	5.5	4.9	4.3
Closing stocks.....	0.5	0.1	0.6	1.4	1.6
Australia (Dec./Nov.)					
Opening stocks.....	0.3	0.4	0.6	0.9	0.8
Production.....	2.8	2.3	3.9	2.0	3.7
Imports.....	—	—	—	—	—
Domestic use.....	2.0	1.6	2.7	1.6	—
Exports.....	0.7	0.5	0.9	0.5	—
Closing stocks.....	0.4	0.6	0.9	0.8	(1.0)
France ^d (July/June)					
Opening stocks.....	1.7	0.9	1.2	1.1	1.6
Production.....	12.1	14.2	15.3	17.5	17.7
Imports.....	0.9	0.7	0.6	0.5	(0.4)
Domestic use.....	10.8	11.4	12.2	13.5	—
Exports.....	3.0	3.2	3.8	4.0	—
Closing stocks.....	0.9	1.2	1.1	1.6	—
Total Five Countries					
Opening stocks.....	70.8	56.1	45.1	41.7	52.5
Production.....	158.7	182.1	189.5	205.6	201.0
Imports.....	1.9	1.6	1.4	1.5	1.4
Domestic use.....	146.6	159.5	162.3	164.5	—
Exports.....	28.7	35.2	32.0	31.8	—
Closing stocks.....	56.1	45.1	41.7	52.5	—

^a Rye, barley, oats, corn (for U.S. corn for grain only), mixed grains, sorghum and millet.

^b Corn and sorghum: October/September.

^c Corn: April/March.

^d Corn: October/September.

tially lower, and corn exports are also likely to be somewhat smaller. Barley exports from Canada are expected to be smaller and South African corn exports will also be smaller as shipments had to be suspended in early March owing to the poor 1969 crop prospects. Larger stocks enabled greater Argentine corn exports to be made in the 1968/69 July/June season in spite of the smaller crop, and Thailand's exports were also higher than in 1967/68 because of the record harvest. French exports of barley and corn have been running ahead of the previous year; most of the rise was due to larger shipments to other EEC countries. Spain exported barley for the first time as a result of the emphasis

placed by the Government on barley production at the expense of wheat. The export surplus of Romania was of a similar magnitude to previous years. Of the developing countries in Africa, Kenya and Malawi exported corn from their good 1968 crops whereas the below-average crop of barley in Tunisia again did not allow any exports to be made.

International Prices in 1968/69

International prices of all coarse grains will almost certainly average lower during 1968/69. Export prices of U.S. corn fell to the exceptionally low level of \$44 per ton early in the season, and world market

prices of sorghums, barley and rye were also sharply reduced. However, U.S. prices of feed grains, and of corn in particular, strengthened during the season following the substantial reduction in the official estimates of the 1968 crop, increased domestic disappearance, the larger quantity going under price support and, in early 1969, the deterioration in the prospects for Southern Hemisphere corn crops. This brought a return to a more normal price relationship between corn and sorghum, which earlier in the season had been distorted by abnormal market conditions.

Outlook for 1969/70

Carryover stocks at the beginning of the 1969/70 season may be about the same as a year earlier, in spite of the smaller exports (Table 7). Available supplies in the main exporting countries in 1968/69 were slightly larger than in the previous years since the rise in opening stocks outweighed the decline in their aggregate production. However, more grain is expected to be used domestically, particularly in the United States. Thus corn stocks are likely to decline, whereas some increase is expected in the carryover of barley, oats and sorghum.

Early indications point towards a further decline in the production of corn in 1969 and an increase in barley production. The 1969 Argentine corn harvest is estimated to be only a little larger than the small 1968 crop, whereas a record crop of sorghums has been reported, allowing larger exports to be made than in the previous season. In Brazil, production of corn in 1969 may be 20 per cent smaller than in the previous year due to drought, and export availabilities will drop accordingly. The South African corn crop was seriously reduced by drought to a level even below last year's poor harvest, and more than 50 per cent below the 1967 crop. Of the larger exporters, only Thailand, which expects a record corn harvest, is likely to increase output, and Thai corn exports are also likely to be larger.

In the United States, the harvested coarse grain area may be lower than in 1968 due to larger acreage diversion under the feed grain program, which aims at a crop slightly below 1969/70 requirements so as to allow a moderate reduction in carryover stocks. In Canada, farmers intended to divert part of their wheat area to coarse grains, and the area planted to oats, barley and corn is expected to increase. Bigger plantings of barley are likely in western Europe, reflecting the smaller winter wheat area due to unfavorable weather at sowing time (e.g. in France and the United Kingdom), a change in production patterns induced by government policies (Spain),

or a general rise in the total grain area (Federal Republic of Germany). In the U.S.S.R. corn and other summer crops are expected to take the place of winter-killed wheat in the southern regions. In developing Africa, very good corn yields are expected in Malawi, whereas the crop in Zambia may not exceed the 1968 harvest due to late planting. Because of the dry weather conditions and the reduction in producer prices, corn production in Kenya may be less than originally estimated, but any reduction may be offset by higher yields being obtained from improved seed varieties. Corn production in the Philippines is expected to decrease due to a reduced area harvested and smaller yields caused by the long drought.

It is too early to estimate the likely volume of trade in 1969/70. Japan, which accounted for a large part of the rise in trade over the last decade, is likely to continue to increase imports in line with the rising feed grain requirements of its livestock industry. Grain feeding will also continue to go up in western Europe, but unlike Japan the major part of these requirements is met by domestic production, and the out-turn of the 1969 harvest of grain and fodder crops in western Europe is still uncertain.

The levelling-off of trade in coarse grains since 1965/66 contrasts with the marked upward trend which had been characteristic of the post-war period. This departure from the past trend can partly be explained by exceptional circumstances, such as the two successive record crops of coarse grains in western Europe in 1967 and 1968. Other market limiting factors appear to be of a more permanent nature, such as the increasing use of wheat as livestock feed and the changes in grain production patterns in favor of feed grain in countries with emerging or growing wheat surpluses. In the EEC, a partial substitution of other ingredients for grains in compound feed mixtures has been a contributing cause.

Over the next few years, the surplus situation in wheat is likely to affect increasingly the coarse grain situation. To the extent that more grain importing countries become self-sufficient in wheat or produce surpluses for export, the policy of encouraging coarse grain production at the expense of wheat, and of making home-produced wheat more competitive as a feed grain, is likely to spread. While relieving the pressure on the world wheat market, such policies may narrow the export outlets for coarse grains.

ASSESSMENT OF PROBLEMS

The FAO Grains Group had concluded at its Tenth Session, that international grain markets appeared to have approached a position of qualified

equilibrium between supply and demand, but had already recognized at its Eleventh Session that significant changes were beginning to take place. Since then, the exportable supplies have risen, while the volume of international trade has declined from its record 1965/66 level, mainly because of the sharp fall in imports into the U.S.S.R. and the reduced dependence of developing countries on outside food grain supplies. As a result, carryover stocks of grains, and of wheat in particular, have risen sharply, and wheat stocks in 1969 are expected to be only marginally below their record levels reached in 1961. As noted above, surplus supplies exerted a strong pressure on international wheat prices in 1968/69, and put a considerable strain on the Wheat Trade Convention of the International Grains Arrangement in its first year of operation. The pressure of supplies led to an increased use of export subsidies, a development which gave ground for concern and should be kept under close review.

The outlook for the 1969/70 season is one of ample wheat supplies almost irrespective of the outcome of the 1969 crops. There is no immediate prospect of any radical change in the situation in the near future, although the possibilities of a further retrenchment in United States production, a decline in the Canadian wheat area and the effect on Australian production resulting from the new delivery quota scheme, would be important factors which might materially influence the situation several years hence.

In the world coarse grain economy, supplies are also more ample than in previous years. The Group noted that a greater pressure of supplies on demand, with a resulting impact on prices, had made itself felt also in world coarse grain markets.

The demand for grains as livestock feed is the most dynamic element in today's grain economy, and promises to remain so in the future. At present, this development is still largely limited to high-income countries, but there is enormous potential scope also in the developing regions. It is probable that the volume of international trade in coarse grains will continue to grow, but markets are likely to become more competitive and the price outlook is uncertain. This reflects the growing use of wheat as livestock feed in the traditional coarse grain importing areas, and the somewhat slower growth in livestock production than in earlier years, which will tend to limit the growth in import requirements for coarse grains, as well as the expansion of production of coarse grains for export in both developed and developing regions.

SUMMARY

World production of grains continued to rise in 1968, reaching 795 million tons (excluding China (Mainland) and excluding rice). This was 4 per cent (30 million tons) more than in 1967 and compared with the 1963/65 average of 660 million tons. All of the increase was in wheat; two-thirds of it in the U.S.S.R.; output of coarse grains declined slightly. In developed countries aggregate grain production was about the same as in 1967, whereas in developing countries it rose for the second year in succession to a level of 15 per cent above that of 1966. As most of the main exporting and importing countries harvested good to excellent crops, there were increased exportable supplies and lower import demand in 1968/69.

A significant decline in world trade in grains of the order of about 10 per cent is likely in 1968/69. The fall will probably be concentrated on shipments on special terms reflecting the better crops (including rice) in developing countries, and particularly in India and Pakistan. Commercial trade in grains is not expected to be much lower than in the previous season.

Wheat prices declined below the minimum levels of the International Grains Arrangement. It appears that grain prices during the full year will average generally lower, although corn prices recovered towards the end of the season.

Early prospects for 1969 point to another good world grain harvest. Excellent spring crops have been produced again on the Indian sub-continent. In North America, the areas under wheat will be smaller and this will probably also be the case in western Europe. These declines may partly be offset in some countries by higher wheat yields, and by larger sowings of coarse grains. In the U.S.S.R. and eastern Europe, grain production was affected by adverse weather conditions early in the season. If weather conditions are favorable, this loss could be offset.

World exportable supplies of grains will remain ample in the 1969/70 season. The main exporting countries hold a sizeable surplus of wheat, and their carryover stocks of coarse grains have also risen. Barring major crop failures, therefore, no general rise in world grain prices seems to be in prospect. The re-emergence of wheat surpluses may affect increasingly the world coarse grains markets.

NOTES

- (1) This article was prepared for publication in *Canadian Farm Economics* by G. G. Pearson.
- (2) All quantity measurements are in metric tons. The following bushel equivalents per metric ton are applicable: wheat—36.7; oats—64.8; barley—45.9; rye—39.4; corn—39.4.

NOTES ON COARSE GRAIN PRODUCTION AND MARKETING IN CANADA

G. G. Pearson and G. A. Hiscocks

Coarse grain production in Canada is expanding to meet the increasing demand for livestock and livestock products. Although some feed grains are grown in every province more than two-thirds of the total production is grown in the Prairie Provinces with the bulk of the remainder grown in Ontario. More than 80 per cent of the feed grains produced are fed to livestock, about 7 per cent is utilized for human food and industrial purposes and about 8 per cent is exported.

Farmers in the Prairie Provinces may sell their coarse grains to feed mills and feed lots within the province or to the Canadian Wheat Board. The Canadian Wheat Board in turn sells oats and barley to the private grain trade either for cash or through the futures market of the Winnipeg Grain Exchange. About 150 million bushels of oats and barley are delivered to the Wheat Board out of an average annual production of about 650 million bushels. Just over 60 per cent of these deliveries are sold in the domestic market and the remainder is exported. The Wheat Board controls the flow of oats and barley to market through the quota system, the same system as is used for wheat, and initial payments are made on delivery of the grain to the elevator. Each grain is handled in a separate pool. After the closing of the pool a final payment is made to the producer in accordance with the quantity and grade of grain marketed in the crop year. In the event that the Wheat Board does not realize sufficient returns from its sales to cover the amounts paid as initial payments plus the expenses incurred by the Board, the federal government is obligated to make up the deficit. The initial payment is in effect a guarantee to the farmer against substantial price declines. Only in the case of oats in 1956-57 have the returns from a pool been insufficient for the Board to make a final payment additional to the initial payment. The non-quota sales which producers have been permitted to make to other producers and feed mills within the province since 1960-61 have no such price guarantee. These "non-quota" mills are free to negotiate prices with producers. The prices received for such sales are usually no higher than the Wheat Board initial price and on occasion are lower.

Since 1941 the federal government has subsidized the transportation costs on grains and millfeeds shipped from the Prairie Provinces to Eastern Canada and British Columbia for livestock feeding. Since 1967 transportation subsidies have been paid

on Ontario wheat shipped into Quebec and on Ontario wheat and corn into the Maritimes. In 1966, the Canadian Livestock Feed Board was set up to administer this program with objectives to ensure availability of feed grains and adequate storage space in Eastern Canada to meet the needs of livestock feeders and reasonable stability and fair equalization of feed grain prices in Eastern Canada and in British Columbia. In Eastern Canada the subsidy rate increases the further east the grain moves, thus equalizing feed grain prices in Eastern Canada at a level slightly above that at the Lakehead. The annual cost of freight and storage assistance is about \$18 million on about 80 million bushels of feed grains, including feed wheat and millfeeds. The subsidy has at least been partially responsible for a shift of feed-intensive livestock production to Eastern Canada. Under the Canadian Wheat Board Act, eastern livestock feeders are prevented access to the cheaper non-quota grains available to western feeders. In recent years, the increase in livestock in Ontario has been associated with the increase in local corn production.

Other things being equal, the most efficient location for livestock production is where the feed grain is produced. (Much of the livestock production in the United States has moved to the grain producing areas.) Feed costs are the largest single input of livestock production, accounting for 60 to 80 per cent of total inputs. It follows that the livestock producer is interested in low grain prices while the grain producer seeks high prices. United States corn is the price-setter for feed grains in world markets. Canada's grains and livestock producers compete in the North American market against strong United States competition. If the Canadian livestock industry is unable to supply the domestic market at competitive prices, the United States livestock industry based on feed grains from the corn belt is likely to displace it.

There are two main schools of thought as to the best way to develop an efficient and competitive grain production industry in Canada, with a livestock industry alongside. The first is to minimize or remove the controls in the system so as to encourage low cost grain producers to increase their sales wherever they wish in Canada. This implies the elimination of feed freight assistance to Eastern Canada and British Columbia livestock producers and the removal of oats and barley marketing responsibilities from the

Canadian Wheat Board. Such a policy, it is argued, would permit the free flow of grains throughout Canada and would permit livestock to be produced in the most efficient areas. The enlarged livestock industry that would develop in the Prairie Provinces would create a need for more forage crops, an alternative land use that would reduce dependence on wheat. However, it must be pointed out that with an open market system it would not be possible to have an initial payment and pooling system as is presently used. It can be argued, too, that an open market system can lead to unduly low prices particularly at harvest time when supplies are greatly in excess of demand. However, this system would give the producer an opportunity to sell at any time for cash. Some security might be provided by a system of price support loans operated in tandem with the United States price support loan program.

The alternative proposal advocates controlling further than at present the movement and trade in feed grains by disallowing non-quota sales not only to feed mills but also to feedlots. In addition, the Wheat Board would be allowed to sell c.i.f. throughout Canada and in export markets (possibly at different price levels in different markets) and the Winnipeg Grain Exchange would no longer need to handle oats and barley. Promoters of this proposal believe such a system would provide them with stable and improved price levels. Controls on sales to feed mills similar to those suggested did apply before 1960-61 but administration and policing proved very difficult. The removal of the handling of coarse grains from the private grain trade would eliminate that trade and require the Canadian Wheat Board to enter the costly business of building or renting elevators and terminals. The extension of the Wheat Board's mandate to the control and sale of

oats and barley in Eastern Canada and British Columbia would conflict with the Canadian Livestock Feed Board, which as presently constituted, has the power to buy and store feed grains in these regions.

Programs of storage and movement out of production areas to markets can promote orderly marketing of coarse grains. Because of low wheat exports and over-production of all grains in recent years, the Wheat Board has been unable to move enough coarse grains from the Prairie Provinces during a year to raise the prices of non-quota grains close to those of quota grains.

World coarse grain production has increased by 20 per cent in the past 10 years. There has been a substantial increase in international trade in coarse grains, reflecting the expansion in livestock feeding in developed countries. The largest part of the increase has been in United States corn. Canada's share of the growing coarse grain market has been declining and is now only about 3 per cent, mostly barley. Canada is situated in a favorable position to service the growing Japanese market for coarse grains (and meat), but we have to compete with barley from France aided by an export subsidy which in recent months has been greater than the f.o.b. selling price of Canadian barley.

Projections of world consumption of coarse grains indicate an increase of about 40 per cent by 1975, mainly as a result of increased feed requirements in developed countries. International trade in feed grains will be highly competitive with United States corn continuing to set the general price level. Canada's future position in feed grain markets at home and abroad depends on the ability of farmers to produce at competitive prices. This will require very efficient production techniques, new high-yielding varieties and aggressive marketing practices.

THE GRAIN DELIVERY QUOTA SYSTEM OF THE CANADIAN WHEAT BOARD

It has long been recognized in Canada that orderly marketing is an effective means of matching the supply of commodities with demand and thereby reducing seasonal price fluctuations. The concept of orderly marketing in Canadian practice has one of its best examples in the grain delivery quota system operated by the Canadian Wheat Board.

The Wheat Board administers a system of quotas whereby grain producers within the area of jurisdiction of the Board are limited to a set pattern of grain marketing with special reference as to where, when, what and how much grain may be marketed. The quota system applies to those grains marketed by the Board (wheat, oats and barley) and also the grains which are not marketed by the Board (rye, flax and rapeseed). The main objectives of the quota system are:

1. To facilitate the orderly marketing of grain by producers and in turn to enhance the efficient use of grain marketing facilities (handling, storage and transportation);
2. To reflect market demand or sales opportunities back to producers and by so doing act as an indirect regulator of aggregate production;
3. To make the management of marketings by the Board acceptable to producers through close adherence to the principle of equality.

As far as it is practicable, given the physical restraints of the handling, storage and transportation system, all producers are permitted over a crop year to share equitably (in relation to the specified acreage or in some instances seeded acreage) in marketing opportunities and in the use of marketing facilities.

The system of quotas administered by the Board consists of the following components:

1. *Unit Quota*: Also known as the Initial Quota because it is operative throughout the designated area immediately on commencement of the crop year, the unit quota consists of 100 units, each unit having a quantitative value in bushels when applied to wheat, oats, barley or rye. For the crop year 1968-69 these unit values were as follows: 4 bushels wheat or 10 bushels oats or 6 bushels barley or 6 bushels rye. Producers may deliver any one or a combination of these grains provided the total bushels expressed in units do not exceed 100. This quota ensures that all producers may deliver grain without regard to the size or location of their farms and since it is not based on acreage, it is of the greatest benefit to small producers.
2. *General Quota*: The general quota applies to

wheat, oats, barley and rye and is based on specified acreage. Specified acreage consists of acreage seeded to wheat (including durum), oats, barley and rye, the summerfallow acreage and the acreage seeded to eligible grasses and forage crops. For example, a one bushel quota means that a producer may deliver a quantity not exceeding one bushel times his specified acreage. The total quantity may consist of one grain or a combination of grains. Space permitting, this process is repeated throughout the crop year, each successive round of deliveries after the first (one bushel quota) being designated as a 2, 3, 4, 5, bushel quota etc. although deliveries for each quota level are restricted to one bushel per specified acre. The quota level may vary according to location throughout the year although every effort is made to equalize the level throughout the designated area by the end of the crop year. Under this quota, the larger producers can avail of a proportionately greater volume of available elevator space.

3. *Seeded Acreage Quota*: This is applied in the case of special crops such as flax and rapeseed (in some years durum wheat) and is defined as so many bushels per seeded acre of the particular crop or a specified quantity whichever is larger.
4. *Supplementary and Over Quotas*: These are used to call forward specified grains for sales commitments that are not being delivered in sufficient quantity under general quotas. They are therefore additional to any previously declared quotas and are normally defined as for seeded acreage quotas although a specified quantity alone may also be called for, for example, an over quota of two carlots.
5. *Special Quotas*: These may be declared to meet a particular set of circumstances as during the 1968-69 season when an "advance" quota was declared for the delivery of high-moisture grain and a special quota was granted certain producers in the Red River Valley area who were threatened with flood damage. Other examples are quotas granted to the estates of deceased producers or to retired producers.

A summary of the quota position for wheat, oats, barley, rye, flaxseed and rapeseed, at the end of each crop year from 1958 to 1968 is given in Table 1.

The present quota system constitutes a producer sales quota. It is not a production quota system.

TABLE 1—SUMMARY OF THE QUOTA POSITION FOR WHEAT, OATS, BARLEY, RYE, FLAXSEED AND RAPESEED, AT JULY 31, 1958 TO 1968

Date	General Quota per Specified Acre	Notes
July 31, 1958	6 bushels at 321 stations 7 bushels at 1,718 stations	Durum quota set at 11 bushels per seeded acre with minimum delivery of 400 bushels. Over quotas of barley for malting purposes continued plus 6 bushels per seeded acre for all grades. Flaxseed placed on open quota.
July 31, 1959	Quotas ranged from 4 bushels to 8 bushels at various stations.	Durum included in general quota. Over quota of one carlot of oats suitable for manufacture to rolled oats. Over quota of barley for malting purposes continued plus supplementary quotas by grades and locations. Flaxseed on open quota. Supplementary quota of 10 bushels of rye per seeded acre.
July 31, 1960	6 bushels at 45 stations 7 bushels at 1,962 stations	Durum included in general quota. Supplementary quota of one carlot of oats suitable for rolled oats or groats. Over quota of one carlot of barley suitable for malting. Flaxseed was placed on open quota.
July 31, 1961	7 bushels	Durum included in general quota. Oats placed on open quota at stations with 7 bushels general quota. Over quotas of barley suitable for malting continued plus over quota of one carlot of barley of any grade or variety. Flaxseed placed on open quota. Supplementary quota of 8 bushels per seeded acre for rye with a minimum delivery of 300 bushels.
July 31, 1962	Open	Over quota of barley for malting purposes continued and producers could apply to deliver any quantity in excess of quota suitable for malting.
July 31, 1963	10 bushels at 6 stations 12 bushels at 1,962 stations	Durum quota set at 15 bushels per seeded acre or 650 bushels whichever larger. Supplementary quota of oats of 5 bushels per seeded acre or 300 bushels whichever larger. Over quotas of barley suitable for malting continued. Rye, flaxseed and rapeseed placed on open quota.
July 31, 1964	8 bushels	Supplementary quota on wheat of 10 bushels per seeded acre except durum. Supplementary quota of one carlot of oats suitable for rolled oats. Over quota of barley suitable for malting continued. Rye, flaxseed and rapeseed on open quota.
July 31, 1965	6 bushels	Supplementary quota of 9 bushels of wheat per seeded acre except durum. Supplementary quota of 4 bushels of oats per seeded acre or 300 bushels whichever larger. Over quota of barley for malting purposes continued also a supplementary quota of 4 bushels per seeded acre of barley or 200 bushels whichever larger, and a supplementary quota of 5 bushels per seeded acre or 200 bushels whichever larger applied to high-moisture barley. Rye, flaxseed and rapeseed placed on open quota.
July 31, 1966	Open	
July 31, 1967	8 bushels	Supplementary quota of 5 bushels of wheat per seeded acre including durum. Supplementary quota of one carlot of oats for rolled oats. Over quota of barley for malting continued. Rye, flaxseed and rapeseed placed on open quota.
July 31, 1968	6 bushels	Durum on open quota. Supplementary quota of two carlots of oats for rolled oats plus supplementary quota of 3 bushels per seeded acre or 200 bushels whichever larger. Over quota of two carlots of barley for malting plus an over quota of any number of carlots of 2-row barley. Rye, flaxseed and rapeseed placed on open quota.

Source: Canadian Wheat Board annual reports.

With the exception of a special policy permitting sales of feed grains to feed mills on a non-quota basis (Feed Mill Policy), producers only make a sale on delivery of their crop to the country elevator. In any given crop year production is completed before the restrictions or demands of the quota system are felt by the producer. If his production turns out to be

untailored to market demand, it is only possible for the producer to be wise after the event and there is a time lag of up to one crop year before he can implement any consequent decisions.

Low quotas are said to provide a signal for a cutback in production. The quotas are not the causative factor in this cutback, however, and producers

would also feel the basic market pressures without a quota system. Under these circumstances, such pressures would bear more unevenly on individual producers.

The system has been criticized as being inflexible and unable to reflect market demand. Given that the required grades and grains are in farm storage, there seems to be adequate provision in the system through supplementary and seeded acreage quotas to meet market demands of a current season. Whatever the system, there will be a natural tendency for producers to deliver the higher value grains as the opportunity arises and surely the value of the grain is a reflection of market demand. As mentioned earlier, the quota system is not a production quota system and in this sense may be considered inflexible.

Fundamental to the system is the concept of equality of opportunity to deliver, that is, allocation of available space on as equitable a basis as possible. In practice, however, it is almost impossible to design a system which is equitable for all producers. The unit quota for example puts the concept into action but is of most benefit to small producers while the general quotas benefit larger producers. Seeded acreage and other quotas tend to benefit producers of the particular commodity at the expense of other producers. It is also true that the system is biased towards wheat production. For example, oats and barley consistently outyield wheat

in terms of bushels per acre, and with the exception of the unit quota, there is no provision for this in the system. (To some extent this is compensated for by the fact that a considerable portion of feed grain supplies are consumed on the farm.) In more general terms, the system is biased in favor of low-yield or extensive production. It has been said that the effort to achieve an equitable system has led to inefficient handling and marketing but it may also be true that such inefficiency where it exists, is part of the related problem of transportation.

SUMMARY

Criticism of the quota system has been continuous since its inception in the 1940's. Main criticisms have been that the system does not indicate to producers soon enough the need to adjust production to meet demand, and that all delivery points are not equalized in delivery opportunities as quickly as they might be. There is general agreement, however, that the quota system has worked well in practice and is the best method yet devised for achieving orderly marketing and production control.

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THE CHANGING PATTERN OF TURKEY MARKETINGS IN CANADA

J. D. F. Kidd

The pattern of growth within the turkey sector of Canadian agriculture has been so variable and complex in recent years that it is worthwhile to review major developments in this respect. Within the turkey sector, major shifts in the location of production, in the seasonal pattern of production and in the composition of product, have been occurring throughout Canada. In addition, organizational links between the various segments of the industry, that is, between growers, processors, suppliers etc. have also undergone many changes, and more can be expected in the future.

Apart from the internal changes within the turkey industry, external developments of various kinds have had a major impact upon turkey production, marketings and prices in Canada. Since turkey meat constituted only about 5.5 per cent of the commercial production of all meats in Canada in 1968, supplies and prices of other meats have a direct impact upon the demand and prices of turkeys and their products. In addition to the competitive effects of other meats, the Canadian turkey sector has had to contend with competition from the turkey industry of the United States. In August 1963, turkeys were removed from the provisions of the Export and Import Permits Act, under which imports of processed turkeys were subject to quotas that were administered by the federal government. Since 1963, the Canadian turkey industry has been directly affected by the volume of production and the level of turkey prices in the United States.

MARKETINGS AND TRADE

Between 1966 and 1968 inclusive, the total volume of turkeys marketed by Canadian producers at registered processing plants in Canada was very stable at an annual rate of about 188 to 189 million pounds, eviscerated weight basis. Prior to this leveling off period in turkey production, a sharp upward trend had occurred in Canadian turkey production beginning in 1963, when marketings totaled 123 million pounds, and lasting to 1966, when total marketings by Canadian producers reached 188 million pounds (Table 1).

The rapid expansion of Canadian turkey marketings between 1963 and 1966 was paralleled by a somewhat similar growth phase of turkey production in the United States between 1962 and 1967 inclusive. Turkey production in the United States in 1962 totaled 1,320 million pounds, eviscerated basis, and expanded continuously to 1,900 million pounds in 1967, a year in which over-production of turkeys became fully apparent in the United States. As a result of the low level to which U.S. turkey prices fell in the main marketing season of 1967, the number of turkeys raised in the United States in 1968 was cutback by 16 per cent from the very high level of production in 1967. However, a record large carry-over of turkeys in cold storages at January 1, 1968 resulted in large supplies, and kept prices at depressed levels in the first half of 1968. Large turkey supplies and low prices in the United States in 1967 and 1968

TABLE 1—TURKEY MARKETINGS (INCLUDES LIVE IMPORTS) AT REGISTERED STATIONS IN CANADA, BY PROVINCE, 1962 TO 1968

	1962	1963	1964	1965	1966	1962-66 Average	1967	1968
	million pounds, eviscerated weight basis							
British Columbia.....	8.8	7.0	9.3	12.1	14.9	10.4	18.4	16.6
Alberta.....	12.1	13.3	12.7	14.2	15.3	13.5	17.6	17.4
Saskatchewan.....	13.4	10.6	10.1	10.6	10.1	11.0	7.9	7.3
Manitoba.....	16.2	15.7	16.9	18.9	18.5	17.2	17.9	15.2
Total West.....	50.5	46.6	49.0	55.8	58.8	52.1	61.8	56.5
Per cent of Canada.....	39.4	37.8	34.9	34.2	31.3	35.1	31.9	29.4
Ontario.....	58.0	58.4	69.8	77.1	89.9	70.7	93.6	96.0
Quebec.....	19.3	17.6	20.8	28.0	36.4	24.4	35.5	37.5
New Brunswick.....	—	—	—	1.4	2.1	0.7	1.9	1.6
Nova Scotia.....	0.3	0.5	0.8	0.9	0.6	0.6	0.6	0.9
Total East.....	77.6	76.5	91.4	107.4	129.0	96.4	131.6	136.0
Per cent of Canada.....	60.6	62.2	65.1	65.8	68.7	64.9	68.1	70.6
Canada.....	128.1	123.1	140.4	163.2	187.8	148.5	193.4	192.5

Source: *Poultry Market Review* (Annuals), Canada Department of Agriculture, Ottawa.

TABLE 2—LIVE AND PROCESSED TURKEY IMPORTS INTO CANADA BY REGISTERED STATION OPERATORS, BY PROVINCE, 1964 TO 1968

	1964	1965	1966	1967	1968
	million pounds, eviscerated weight				
Live Turkey					
British Columbia	1.2	1.8	—	—	—
Manitoba	0.8	0.1	—	1.0	0.2
Ontario	2.5	1.3	0.1	3.8	3.3
Quebec	0.2	—	—	—	—
Total live	4.7	3.2	0.1	4.8	3.5
Eviscerated	5.4	0.2	—	1.3	0.3
Parts	n.a.	0.2	0.2	0.3	0.7
Total turkey	10.1	3.6	0.3	6.4	4.5

n.a. — not available.

Source: *Poultry Market Review* (Annuals), Canada Department of Agriculture, Ottawa.

also resulted in the resumption of turkey exports to Canada in 1967.

Following the removal of quantitative import controls in 1963, turkey imports into Canada from the United States in 1964 totaled 10.1 million pounds, eviscerated basis, but declined sharply from the volume of the previous year in both 1965 and 1966. In these years Canadian turkey production was expanding rapidly, and turkey prices in Canada in 1966 were below the costs of imported turkeys from the United States. This situation changed in 1967 and 1968 due to sharp decreases in U.S. turkey prices in those years (Table 2).

Since 1965, turkey imports into Canada have consisted mostly of live turkeys bought by processors in Ontario, and to a lesser extent by processors in Manitoba. In 1968, of the 238,000 live turkey imports, about 182,000 were in the heavy hen weight range (over 12 and under 20 pounds). The import duty on these birds is 2 cents a pound compared with the minimum duty rate of 5 cents a pound, or alternatively 12.5 per cent ad valorem on processed product. Whenever turkey products exceed an invoice value of 40 cents a pound, the 12.5 per cent ad valorem rate applies up to a maximum of 10 cents a pound. The level of turkey prices in the United States tends to set a ceiling beyond which prices in Canada cannot rise without inducing turkey exports from the United States.

Allowing for exchange, freight and other import costs, the margin of protection on live and processed turkeys is about 4.5 and 8.5 cents a pound respectively when live and processed turkeys are 20 and 32 cents a pound respectively in the Central States. Thus, it is comparatively less expensive to import live turkeys rather than processed turkeys whenever abnormally low prices prevail in the United States, or whenever Canadian supplies are short of requirements.

The prevailing structure of the tariff on live and processed turkeys of 2 and 5 cents a pound respectively gives to turkey processors a larger element of protection in relation to U.S. turkey prices than is available to Canadian turkey growers. Because of large numbers of live turkeys on farms in the U.S. Midwest within short trucking distances of plants in Ontario and Manitoba, live producer turkey prices and the contract bargaining positions of producers are disproportionately weakened in relation to the negotiating position between processors and large retailer buyers of processed turkeys.

PATTERN OF CANADIAN MARKETINGS

Within Canada, most of the overall growth in turkey marketings between 1962 and 1968 inclusive occurred in Ontario and Quebec, the major producing provinces, and to a lesser extent in British Columbia and Alberta. Turkey marketings at registered plants by Ontario producers in 1968 totaled 92.7 million pounds, almost 50 per cent of the Canadian total, and were up sharply from marketings of 58 million pounds in 1962. Most of this expansion in Ontario occurred prior to 1968. In Quebec, turkey marketings almost doubled between 1962 and 1966, whereas in Western Canada, marketings of 56.5 million pounds in 1968 were up by only 10 per cent from the volume of marketings in 1962. The rate of growth of turkey marketings in British Columbia, and to a lesser extent in Alberta contrasts rather sharply with the static position in Manitoba and the declining trend in Saskatchewan.

Rapid expansion of broiler turkey (12 pounds and under, live basis) production in Ontario, Quebec, British Columbia and Alberta between 1962 and 1967 accounts for a major portion of the locational, compositional and seasonal shifting within the turkey sector in recent years. Broiler turkey marketings in

TABLE 3—BROILER TURKEY (12 POUNDS AND UNDER) MARKETINGS BY CANADIAN PRODUCERS AT REGISTERED STATIONS IN CANADA, BY PROVINCE, 1962 TO 1968

	1962*	1963	1964	1965	1966	1962-66 Average	1967	1968
	thousand head							
British Columbia.....	141	206	300	360	608	323	759	700
Alberta.....	65	99	166	192	288	162	340	299
Saskatchewan.....	2	19	28	31	39	24	20	21
Manitoba.....	135	102	152	192	146	146	85	43
Total West.....	343	426	646	775	1,081	655	1,204	1,063
Per cent of Canada.....	10.0	10.8	12.2	12.4	13.2	12.1	13.9	12.5
Ontario.....	1,874	2,326	3,090	3,334	4,438	3,013	5,036	4,741
Quebec.....	1,189	1,150	1,483	2,024	2,537	1,676	2,291	2,447
New Brunswick.....	—	—	3	36	60	20	87	131
Nova Scotia.....	13	47	76	75	65	55	66	91
Total East.....	3,076	3,523	4,652	5,469	7,100	4,764	7,480	7,410
Per cent of Canada.....	90.0	89.2	87.8	87.6	86.8	87.9	86.1	87.5
Canada.....	3,419	3,949	5,298	6,244	8,181	5,419	8,684	8,473

* 10 pounds and under.

Source: *Poultry Market Review* (Annuals), Canada Department of Agriculture, Ottawa.

Canada in 1968 totaled 8.5 million head, equivalent to 67.2 million pounds, eviscerated basis, more than double the volume of marketings in 1963 (Table 3). The weight classification for live broilers was revised from 10 pounds and under in 1962 to 12 pounds and under in 1963. Broiler turkey marketings in Eastern Canada in 1968 accounted for 87.5 per cent of the Canadian total, down slightly from 89.2 per cent in 1963. In contrast with the highly seasonal pattern of heavy turkey production, broiler turkey production is operated on a more regular year round basis in much the same manner as broiler chicken production. Consumer demand for this weight of turkey has been particularly evident at statutory holidays, as well as during the Christmas Season.

The trends in the production of heavy hens (over

12 and under 20 pounds, live) in Canada have been adversely affected by the competition from broiler turkeys, whose costs of production are about 3 to 4 cents a pound below the average costs of producing heavy hens. Marketings of heavy hens at registered stations in Canada by Canadian producers in 1968 totaled 3.2 million head, equivalent to 40.7 million pounds, eviscerated basis, compared with marketings of 2.9 million head in 1963 (Table 4).

The growth in the production of heavy hens in Central Canada has not kept pace with market requirements in that region, as the bulk of the turkey imports in 1968 consisted of live heavy hens into Ontario. A large proportion of the female heavy type poults that are hatched during the fall and winter are raised as broiler-weight turkeys in Ontario

TABLE 4—HEAVY HEN TURKEY (OVER 12 AND UNDER 20 POUNDS) MARKETINGS BY CANADIAN PRODUCERS AT REGISTERED STATIONS IN CANADA, BY PROVINCE, 1962 TO 1968

	1962*	1963	1964	1965	1966	1962-66 Average	1967	1968
	thousand head							
British Columbia.....	275	177	185	260	330	246	410	319
Alberta.....	363	335	317	345	362	344	401	435
Saskatchewan.....	423	340	321	332	326	348	241	207
Manitoba.....	487	431	465	507	516	481	433	407
Total West.....	1,548	1,283	1,288	1,444	1,534	1,419	1,485	1,368
Per cent of Canada.....	42.6	44.9	44.6	44.7	41.7	43.6	41.8	42.5
Ontario.....	1,668	1,244	1,262	1,314	1,521	1,402	1,478	1,422
Quebec.....	396	323	325	407	561	403	538	394
New Brunswick.....	—	—	2	42	54	20	45	29
Nova Scotia.....	19	4	11	21	6	12	6	9
Prince Edward Island.....	2	3	2	—	—	2	—	—
Total East.....	2,085	1,574	1,602	1,784	2,142	1,839	2,067	1,854
Per cent of Canada.....	57.4	55.1	55.4	55.3	58.3	56.4	58.2	57.5
Canada.....	3,633	2,857	2,890	3,228	3,676	3,258	3,552	3,222

* Over 10 and under 20 pounds.

Source: *Poultry Market Review* (Annuals), Canada Department of Agriculture, Ottawa.

TABLE 5—HEAVY TOM TURKEY (20 POUNDS AND UP) MARKETINGS BY CANADIAN PRODUCERS AT REGISTERED STATIONS IN CANADA, BY PROVINCE, 1962 TO 1968

	1962	1963	1964	1965	1966	1962-66 Average	1967	1968
	thousand head							
British Columbia.....	213	142	152	202	301	202	357	329
Alberta.....	363	406	348	381	386	377	456	423
Saskatchewan.....	388	306	290	300	277	312	222	204
Manitoba.....	454	464	417	523	493	470	486	423
Total West.....	1,418	1,318	1,207	1,406	1,457	1,361	1,521	1,379
Per cent of Canada.....	48.1	46.7	43.4	42.7	40.1	44.0	41.2	36.5
Ontario.....	1,243	1,277	1,346	1,517	1,666	1,410	1,587	1,767
Quebec.....	285	224	229	334	462	307	547	612
New Brunswick.....	—	—	1	33	46	16	36	15
Nova Scotia.....	1	1	—	4	3	2	—	3
Prince Edward Island.....	1	—	—	—	—	—	—	—
Total East.....	1,530	1,502	1,576	1,888	2,177	1,735	2,170	2,397
Per cent of Canada.....	51.9	53.3	56.6	57.3	59.9	56.0	58.8	63.5
Canada.....	2,948	2,820	2,783	3,294	3,634	3,096	3,691	3,776

Source: *Poultry Market Review* (Annuals), Canada Department of Agriculture, Ottawa.

and Quebec. Since the main demand for heavy hens occurs at Christmas, most production programs are directed to meet the demand on that occasion. In addition, further feeding of broiler toms for the Christmas market increases supplies of birds in the heavy hen weight range. This practice is also common in Ontario and Quebec whenever price relationships between broilers and heavy hens are favorable.

Heavy turkey production is relatively more important in Western Canada than is the production of broiler turkeys. In 1968, Western Canada accounted for 42.5 and 36.5 per cent of the Canadian marketings of heavy hens and toms respectively. Between 1962 and 1968, there was a fairly level trend in both heavy hen and tom production in Western Canada, but because of the sharp upward trend in the production of straight heavy tom flocks in Ontario and Quebec, the percentage of the Canadian market supplied by Western Canadian heavy turkey production has continuously declined. Because of the deficient position of Western Canada in broiler weight turkeys, practically all of the heavy hens produced in Western Canada move into retail markets in that area. Very few, if any, processed turkeys, over 10 and under 16 pounds, are shipped from the Prairies to buyers in Eastern Canada. On the other hand, there are regular shipments of broiler weight turkeys from Ontario into Manitoba for distribution in the Prairie region.

The marketings of heavy toms (20 pounds and up, live) in Western Canada has declined from a heavy surplus position in 1962, when Western Canada accounted for 48 per cent of Canadian production of heavy toms, to a much smaller surplus position in 1968, when they accounted for 36.5 per cent of heavy tom marketings in Canada (Table 5). Since

Western Canada accounts for about 27 per cent of the Canadian population and Northern Ontario and Northwestern Quebec for about another 5 to 6 per cent, it is likely that most of these heavy toms, 16 pounds and up, were utilized within this region.

The rapid expansion of the production of heavy tom turkeys in Ontario and Quebec between 1962 and 1968 has been partly induced by the growth of the public feeding industry (restaurants, cafeterias etc.) and by the development of new further processed turkey products, as well as by the normal growth of retail sales to consumers of heavy turkeys. These trends are expected to continue.

PRICE TRENDS

Between 1962 and 1968, live turkey prices to producers in Canada have trended sharply downward. This has been especially evident in the case of prices of broilers and heavy hens and less so with respect to prices of heavy toms. For example, broiler turkey prices to producers at London, a major producing area, averaged 27 cents a pound during the fall marketing season of 1962, and had dropped to 23 cents a pound in the same period of 1968. Similarly, prices to producers of live heavy hens at Winnipeg and London dropped by about an average of 3 cents a pound over the same period, whereas producer prices of heavy toms at these markets fell by about 1 to 2 cents a pound between 1962 and 1968 (Table 6).

The strength of turkey markets in 1965 and 1966 was largely due to sharply reduced hog production and high red meat prices in North America in those years. This situation was partly responsible for the over-production of turkeys that followed in the

TABLE 6—PRICES OF TURKEYS (LIVE NO. 1 TO PRODUCERS) DURING THE FALL SEASON AT WINNIPEG AND LONDON, 1962 TO 1968

	Winnipeg			London		
	Sept.	Oct.	Nov.	Sept.	Oct.	Nov.
cents per pound, live basis						
12 pounds and under						
1962 ^a	30.0	30.0	27.0	26.8	27.0	27.0
1963.....	—	—	—	25.2	25.8	25.6
1964.....	24.0	24.0	24.0	24.0	23.6	23.1
1965.....	—	26.0	26.8	23.5	23.9	24.8
1966.....	25.1	25.4	25.5	23.0	23.0	23.0
1967.....	—	—	—	22.1	22.9	22.6
1968.....	—	—	25.5	23.0	23.0	23.0
Over 12 and under 20 pounds						
1962 ^a	31.2	29.0	27.5	29.0	28.2	28.0
1963.....	25.0	25.0	25.8	25.2	25.5	27.1
1964.....	24.9	24.9	26.0	25.1	25.0	25.7
1965.....	25.8	26.5	27.8	25.9	27.0	28.8
1966.....	24.9	26.2	28.0	25.0	25.5	26.5
1967.....	24.0	24.8	25.0	24.0	24.9	24.8
1968.....	26.1	26.2	26.5	25.5	25.5	25.6
20 pounds and up						
1962.....	27.0	24.5	22.0	25.9	24.3	24.0
1963.....	21.5	21.5	21.5	23.0	22.8	22.5
1964.....	23.3	23.2	23.2	24.3	23.8	23.9
1965.....	23.8	24.2	24.5	23.4	23.8	24.2
1966.....	22.8	22.6	23.6	23.0	23.0	23.4
1967.....	23.1	22.4	21.8	23.0	23.0	23.0
1968.....	22.2	22.4	22.4	23.0	23.0	23.2

^a 10 pounds and under.

^b Over 10 and under 20 pounds.

Source: *Poultry Market Review* (Annuals), Canada Department of Agriculture, Ottawa.

United States in 1967. In contrast, the Canadian turkey industry recognized the threat of excessive production in the early months of 1967, and held the line on 1967 production programs. However, turkey prices in Canada fell sharply in 1967 because of the competition from lower-priced turkey imports from the United States. Following a mild recovery of price levels for turkeys in 1968, the supply and price outlook for 1969 indicates further strengthening of turkey prices in North America.

Organizational changes in the turkey industry in recent years have likely reduced the possibility of over-production in turkeys in North America in future years. In both the United States and Canada, the production and marketings of turkeys are predominantly on an integrated or contract basis between grower, supplier and/or processor. The

volume of turkeys that are raised by independent producers for sale in the open market has steadily declined, partly because of the heavy risks involved in uncertain markets.

In Ontario and Western Canada, turkey producers have established quota marketing boards for turkeys in an attempt to co-ordinate production with market requirements. The turkey boards have been organized under provincial farm products marketing legislation. The managements of turkey boards will implement quota and pricing policies for live turkey production and marketing programs for producers in their respective jurisdictions. In setting quota levels and price targets, account will have to be taken of the factors affecting inter-provincial and foreign trade in turkeys, and of the factors affecting competition between turkeys and other meats.

POLICY AND PROGRAM DEVELOPMENTS

Cheddar Cheese Exports—The Canadian Dairy Commission will control sales of cheddar cheese to British buyers in 1969-70. The present arrangement provides for the sale of 29 million pounds of Canadian cheese between April 1, 1969 and March 31, 1970. This is approximately 5 per cent less than the average annual exports from 1965-66 to 1967-68.

The Commission will provide export assistance on sales up to the agreed volume, which will be allocated among exporting firms in proportion to the export sales of each over the past three years. (June 20, 1969)

Economics Branch Appointment—Dr. Darrel Plaunt has been named Director of the Farm Management Division of the Economics Branch, Canada Department of Agriculture.

The Farm Management Division, created during a recent re-organization of the Economics Branch will be involved in the development and evaluation of federal policies and programs influencing the management of agricultural resources, both human and material.

Dr. Plaunt was formerly with the University of Guelph. (June 10, 1969)

Crop Insurance in Saskatchewan—The Saskatchewan crop insurance plan has been extended to include additional areas in that province. An amendment to the plan specifies that premiums paid are to be such that the plan will be self-sustaining.

Crops covered under the Saskatchewan plan are wheat, oats and barley. (June 25, 1969)

Manitoba Crop Insurance—The list of insurable crops under the Manitoba crop insurance plan has been extended to include sunflower seed, peas and potatoes. Other crops insured under this plan are wheat, oats, barley, flax, fall rye, mustard seed, rapeseed and sugar beets.

In a limited test area, additional crop insurance coverage will be provided for those farmers who meet the requirements of an "Improved Practices Program". Under this experimental program a farmer must follow specified cultural and management techniques to qualify for the additional coverage.

Premiums paid by the Manitoba farmers must be such that the crop insurance plan will be self-sustaining. (July 2, 1969)

PUBLICATIONS

ECONOMICS BRANCH PUBLICATIONS

Provincial Agricultural Legislation in Western Canada, 1968 Supplement, Joyce, T. F., Economics Branch, Canada Department of Agriculture, Regina, May 1969, Publication No. 69/3. pp. iii + 136 to 156.

This second supplement to the 1966 bulletin of the same name contains summaries of the 1968 provincial acts and amendments relating to agriculture.

Marketing Boards in Canada, 1967, Fortier, R., Economics Branch, Canada Department of Agriculture, Ottawa, May 1969, Publication No. 69/4. pp. 9.

The eleventh annual summary of the activities of marketing boards in Canada.

A Study of the Marketing of Canadian Apples in Relation to the Feasibility of a National Marketing Board, Marketing and Trade Division, Economics Branch, Canada Department of Agriculture, Ottawa, March 1969, Publication No. 69/5. pp. ii + 64.

This report is an analysis of the apple industry in Canada, from production to disposition, focussing on the role a national marketing board could have in this industry.

UNITED NATIONS PUBLICATIONS

Available in Canada from the Queen's Printer, Ottawa.

Co-opérative Research on Input/Output Relationships in Cow Milk Production, de Boer, F., A. Eriks, G. Hamming, M.L't Hart and J. de Veer, Organization for Economic Co-operation and Development, Paris, 1969. pp. 136.

This report is one of four relating to co-operative interdisciplinary research among natural scientists and economists to improve input/output data in farm planning and agricultural policy. The analyses in this report concern the problems and variables in cow milk production.

OTHER PUBLICATIONS

Not available from the Economics Branch

Feed Mill Study, Food Products and Chemicals Branch, Department of Industry and Commerce, Province of Manitoba, Winnipeg, Manitoba, November 1968.

The report of a study with the following objectives: (1) to define the variables associated with feed mill operation,

- (2) to determine the present commercial feed mill status in Manitoba by location and size,
- (3) to summarize existing cattle, hog and poultry numbers by local area,
- (4) to review existing feed mill facilities with respect to present animal population and growth patterns,
- (5) to identify potential areas for feed manufacturing and promotion of feedlot operations.

Feed Lot Study, Food Products Branch, Department of Industry and Commerce, and the Animal Industry Branch, Department of Agriculture, Province of Manitoba, Winnipeg, Manitoba, May 1969. pp. 81.

This study used a mathematical model to estimate the average return to capital invested in a feedlot handling 4,000 head of cattle in Manitoba. Results are estimated by months for a six-year period beginning in 1963. Much of the information was taken from the actual experience of progressive feedlots. Based on the assumptions and conditions noted in this report, it should have been possible to realize an average annual net return of 13 per cent over the six-year period on equity invested in a cattle feeding enterprise.

Father/Son Agreements and Other Farm Partnership Forms, Jones, A. R., Farm Management Branch, Economics Division, Alberta Department of Agriculture, Edmonton, Alberta, May 1969, Publication No. 817.80-3. pp. 26.

A collection of forms designed to show farmers how to set out in writing their business arrangements with relatives or other partners, shareholders or tenants.

The Cattle Feeder and the Futures Market, Gorr, J. G., Farm Management Branch, Economics Division, Alberta Department of Agriculture, Edmonton, Alberta, May 1969, Publication No. 842/420-16. pp. 5.

A short explanation of the futures market for cattle.

Analysis of the 1969 Hog Grading System on Nova Scotia Farms, Gervason, Paul and Don Cox, Nova Scotia Department of Agriculture, Truro, May 1969. pp. 6 + appendix.

This report is the result of a study carried out at

the request of the Nova Scotia Hog Producers Association to determine the relationships between the weight, sex and grade index of hogs marketed under the new grading system that started January 1, 1969.

Data are based on records kept by 10 commercial hog producers for January and February 1969.

Canadian Journal of Agricultural Economics, Vol. 17, No. 1, February 1969. Published three times a year by the Canadian Agricultural Economics Society. Copies available from the Society at Box 632, Postal Station B, Ottawa 4, Ontario Canada. Single copies: \$3.50. Annual subscription: \$10.00.

Contents of the February 1969 issue include the following articles:

- Canada's Future Role in the World Wheat Market
- Estimation of Asymmetric Longrun Supply Functions: The Case of Coffee
- Spatial Price Equilibrium with Stochastic, Inelastic Supply
- A Framework for Viewing Simulation
- Monte Carlo Simulation of Management Systems
- Multicollinearity and Consumer Demand Elasticities
- Development of a Two-Stage Equipment-Enterprise Selection Method
- Regional Livestock Production and Feed Freight Assistance
- Measuring the Effect of Weather on Crop Production
- Weather and Prairie Wheat Production
- Tenure Patterns and the Commercialization of Canadian Agriculture
- Principles for Allocating Wildland Among Alternative Uses
- Farm Income Policy in Ontario: Review and Analysis
- Theoretical and Empirical Problems in Local Government Consolidation

The Competitive Position of Maritime Agriculture, Atlantic Development Board, Queen's Printer, Ottawa, 1969, Cat. No.: TD 2-1/2. pp. x + 175.

This is the report of a study of the potential for agriculture in the three Maritime Provinces. It consists of an appraisal of the physical, economic and institutional environment relative to agricultural expansion. Included is a chapter on the relative profitability of various agricultural enterprises in this region.

VOLUME 4 NUMBER 4

OCTOBER 1969

CANADIAN FARM ECONOMICS



- The Importance of Agriculture to the Canadian Economy..... I. F. Furniss 1
- Some Highlights of a Survey of Incorporated Family Farms in Ontario..... R. A. Stult 9
- Regional Comparisons of Death Rates Of Farm Animals in Canada..... W. Y. Yang 14
- The Prairie Grain Advance Payments Act, 1957-1968..... J. W. Channon 18
- Policy and Program Developments..... 21
- Publications..... 21

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CANADIAN FARM ECONOMICS

THE IMPORTANCE OF AGRICULTURE TO THE CANADIAN ECONOMY

I. F. Furniss

The 1960's have been a period of great changes in the Canadian farming industry. The Canadian Agriculture Congress, held in Ottawa from March 24 to 27, 1969, and the work of the Federal Task Force on Agriculture have pointed up the critical situation in which the industry is today in terms of returns to resources, of markets for farm products, and of competition from foreign producers. This situation has come about in spite of considerable adjustment which has taken place in the industry under the economic pressure of low returns to resources, of expanding alternative opportunities and of greatly increased efficiency.

There has been a tendency, perhaps, to downgrade the importance of the farming industry in the economic life of the nation because of greater relative growth in other sectors. One of the reasons for this is the fact that many operations formerly done on the farm itself are now done in the non-farm sector. This applies particularly to the provision of many farm inputs and to the processing and distribution of farm products. This paper, then, will be an attempt to document the current overall importance of the farming industry in the economy of the nation. In this way it is hoped to place the industry in its proper perspective, both in terms of the direct contribution of the primary sector to the economy and in terms of its interdependence with the non-farm sector.

THE NATURE OF THE INDUSTRY

Probably to most people, farmers and non-farmers, a "farm" means a single-family business enterprise, based on land, in which the operator and his family provide most of the capital and labor. Such a definition would imply that farming is the main source of the operator's income. But things are not quite this simple in practice. Often, farming

operations are combined with non-farm work. Generally, the smaller the income of a farm operator from his farming operation, the greater is his income from other sources (1). Furthermore, land is a relatively minor part of the total farm asset structure in certain types of farming such as broilers, cattle feedlots or hothouse vegetables (2).

The Census of Agriculture defines a farm as "... an agricultural holding of one acre or more with sales of agricultural products, during the 12-month period prior to the census, of \$50 or more." (3). In the last census (1966) there were 430,500 such holdings. Obviously many of these are not farms within the sense of our definition. However, those census farms with sales of agricultural products of \$10,000 a year or more numbered 95,000 or 22 per cent of all census farms. This group of farms produced 65 per cent of the total value of farm production (Table 1). Furthermore, according to the classification of taxpayers used by the Department of National Revenue (4), there were 119,500 farmers paying income tax at about the same date. Thus, it seems reasonable to conclude that although there are 430,500 census farms (holdings), the core of the Canadian commercial farming industry numbers about 100,000 farms, whereby "commercial" we mean farms from which the operator derives the greater part of his total income.

Canadian farming is dominated by two types, wheat and livestock farms. These two categories account for half of the commercial census farms (5). Dairy farms number about one-fifth of the total while small grain farms, other than wheat, make up about 10 per cent. The predominance of these types of farms is a result largely of climate and other physical limitations. Eighty per cent of the total agricultural land lies in Western Canada which, under present technology, is most adapted to the production of wheat, coarse grains and oilseeds, especially flaxseed and rapeseed.

TABLE 1—CENSUS FARMS CLASSIFIED BY VALUE OF SALES OF FARM PRODUCTS, 1966

Sales of Farm Products	Number of Census Farms	Total Sales of Farm Products	
		Amount	Per Cent of Total
		thousand dollars	
Institutional Farms.....	777	15,039	0.5
\$ 50—\$2,499.....	152,910	149,420	4.5
\$ 2,500—\$4,999.....	84,947	309,644	9.3
\$ 5,000—\$9,999.....	96,856	691,377	20.7
\$10,000 and over.....	95,032	2,172,130	65.0
Totals.....	430,522	3,337,610	100.0

Source: 1966 Census of Canada: Agriculture, Cat. No. 96-601, Table 30, Dominion Bureau of Statistics.

THE RESOURCE STRUCTURE OF AGRICULTURE

The total investment in Canadian agriculture of farm operators is estimated to be \$22.4 billion (1968), or about \$41,000 per worker (excluding rented land and buildings). Seventy-one per cent of the total investment is in real estate, 18 per cent in machinery and 11 per cent in livestock and poultry (6). The total land area in farming amounts to 174 million acres of which 76 per cent is owned by farm operators and 24 per cent is rented (7).

New capital formation in agriculture is estimated to be about a billion dollars a year or about 8 per

cent of total new capital formation (8). The sources of new capital available to agriculture are varied but a few sources predominate (9). The federal Farm Credit Corporation provides about two-thirds of the mortgage credit obtained by Canadian farmers. In the intermediate-term credit field (18 months to 10 years), guaranteed loans provided by the banks under the federal Farm Improvement Loans Act are the most important single source—about 40 per cent of the amount extended in this term. Non-FILA loans provided by the banks are the most important source of short-term credit (less than 18 months) to farmers, over 55 per cent of the total.

TABLE 2—EMPLOYMENT, EARNINGS AND OUTPUT IN SELECTED AGRIBUSINESS FIRMS, CANADA, 1961 OR 1966

Industry and Year	Number of Establishments	Total Number of Employees	Total Salaries and Wages	Value of Shipments of Goods	Value Added in Total Activity
			million dollars		
1966					
Food and Beverages.....	6,945	227,221	1,058.0	7,062.0	2,498.5
Leading subindustries:					
Slaughtering and meat-packing.....	317	27,041	147.2	1,529.7	266.9
Dairy factories.....	1,308	31,845	147.2	1,071.0	286.8
Fruit and vegetable canners.....	314	20,558	81.4	470.3	200.3
Feed manufacturers.....	860	8,869	40.3	468.8	113.8
Bakeries.....	2,363	34,092	141.4	463.4	247.5
Breweries.....	52	9,391	64.5	321.3	232.9
Miscellaneous food manufacturers.....	269	13,664	69.6	592.2	244.6
Tobacco products.....	34	10,177	53.5	429.8	171.0
Leather.....	537	32,667	117.9	370.9	183.5
Agricultural implements.....	105	14,498	85.3	328.3	150.8
1961					
Mixed fertilizers.....	43	1,378	6.6	54.3	—
Wholesale trade ^a	5,861	52,298	185.1	—	—
Grand "Totals".....	13,525	338,239	1,506.4	—	—

Includes cooperative marketing associations, wholesale merchants, agents, brokers and manufacturers' sales branches. Products handled include farm products as raw materials, farm supplies, food products, tobacco, groceries and food specialties.

Sources: (1) 1966 Census of Manufacturers, Cat. No. 31-201P to 31-208P, December, 1968, Dominion Bureau of Statistics.

(2) General Review of the Manufacturing Industries of Canada, 1961, Cat. No. 31-201, September, 1965, Dominion Bureau of Statistics.

(3) Canada Year Book 1966, Table 2, pp. 858-859, Dominion Bureau of Statistics.

Perhaps the most important single change in resource use in agriculture in the past two decades has been the continuing substitution for labor of purchased capital inputs. The latter include machinery and associated requirements, purchased feed and seed, fertilizers, pesticides and hired custom work. In 1948, the farm labor force numbered 1,096,000 persons, 22 per cent of the total employed Canadian labor force. By 1968, the numbers were down to 546,000 or 7 per cent of a much larger total labor force. Moreover, the structure of the farm labor force itself has changed notably with unpaid family help declining somewhat in relative importance and hired labor increasing (10). Since about 1951 the size of the hired farm labor force has been relatively stable at about 100,000 workers but rising from 11 per cent to 18 per cent of the total.

Concomitant to the declining labor input in Canadian agriculture has been the increase in the capital input. If we consider all inputs in the trilogy of real estate, labor and capital, where capital is all other inputs than those designated as real estate and labor, then we find that capital inputs have increased from about a third of the total inputs in the 1948-52 period to over 50 per cent in recent years (11). From an industry which used to be largely independent of other sectors for its production inputs, the primary agricultural industry has become one which is highly dependent upon the non-farm sector for supplies and services.

INTERDEPENDENCE OF FARMING AND AGRIBUSINESS

In recent decades, the non-farm industries which produce goods and services for farm use, together with those businesses engaged in the processing of raw materials of farm origin, have come to be known as the "agribusiness" sector. It includes the manufacturers of farm machinery, fertilizers and pesticides; the processors of farm products into goods for intermediate or final consumption—dairy manufacturing plants, feed manufacturers, flour mills, bakeries, breweries, slaughtering and meat packing plants, fruit and vegetable canners; and the distributors of farm supplies. In addition, there are a host of businesses dependent partly upon the farm sector. This includes the transportation companies, the oil companies, the food wholesalers, retail stores, financial institutions, real estate firms and many others.

Employment in the areas of food processing, tobacco manufacturing, leather goods, manufacturing of implements and fertilizers and wholesale trade related to agriculture totals around 338,000 persons

(Table 2) or equal to about 60 per cent of the employment in the farm sector (12). The two groups together comprise about 12 per cent of total employment. There are, however, other sectors of the economy for whom an important part of their total business is concerned with the transportation of farm products, the provision of supplies and services and the retail sale of foods. For example, about 18 per cent of total rail freight is comprised of farm products (13). Agricultural commodities represent about one-quarter of the tonnage moving through the St. Lawrence Seaway (14). Farm expenditures on gasoline, diesel oil and lubricants are equal to about 17 per cent of the total sales of motive fuels for use in motor vehicles on public streets and highways (15). In the financial area, total credit extended to farmers has been estimated at \$2.179 million (16). Of this amount, the commercial banks handled 43 per cent, both short-term and intermediate-term. In the wholesale trade field, almost one-quarter of the persons employed owe their employment to the sale of farm products, food products or farm supplies. Employment in this area is at least 52,000 persons (17).

It is almost impossible on the basis of available information to determine how many of the persons employed in the retail trade owe their livelihood directly to the handling of Canadian farm products or the provision of production services and supplies. However, it is intuitively obvious that this is an important sector of total retail business. No Canadian studies are available on a comparable basis but a recent United States study indicated that employment in the farm supply, food and fibre processing and distributive industries, that is, agribusiness, makes up about one-quarter of total employment which, together with farming, adds up to 30 per cent of total employment (18).

THE CONTRIBUTION OF FARMING TO THE ECONOMY

Returning to a consideration of the contribution of the primary agricultural sector to the national economy (19), the relative importance of the industry can be measured in terms of statistics such as gross domestic product, exports of farm products, tax revenues, overall productivity, consumer expenditures on food and foreign economic development. Each of these will be dealt with briefly.

Total Canadian Gross Domestic Product was estimated to be \$54.2 billion in 1967 (current dollars) of which agriculture contributed 4.6 per cent or \$2.5 billion. Although the contribution by agriculture has

been relatively constant at 5 to 6 per cent since 1957, in prewar years the proportion arising in the agricultural sector was about 12.5 per cent (20). The relative decline in agriculture's contribution occurred mostly in the 1951 to 1956 period. These were years of rapid industrial expansion. Currently, agriculture ranks between eighth and ninth as a contributor to G.D.P., on the basis of a classification of 15 sectors, or about the same as wholesale trade. This position has been relatively unchanged throughout the 1960's. Agriculture has been, however, and continues to be, the leading primary industry ranking ahead of forestry, fishing, mining and oil wells.

Employment in the agricultural sector at 7.3 per cent of total employment (1968) is somewhat higher than the sector's contribution to G.D.P. This has been characteristic of the industry, reflecting the somewhat lower average earnings in agriculture as compared with selected other sectors. The numbers of persons employed in agriculture are about two and a half times the employment in all other primary industries, exceeding those in the finance, insurance and real estate sector and the construction industry (21).

The farming industry has long been an important contributor to Canadian export trade. However, in 1967 and 1968, with the expansion in non-farm exports and with farm exports stable at around \$1.4 billion, agricultural exports slipped to 11 per cent of total merchandise trade from about 20 per cent in the early 1960's (22). However, exports of farm products from Canada continue to exceed the value of imports of agricultural products. These currently amount to \$1.1 billion (1968) or 9 per cent of total merchandise imports. Canada runs a trade deficit in agricultural commodities with the United States but a surplus with Britain and all other countries as a group. Wheat and wheat flour is the most important single agricultural commodity exported, representing over one-half of total agricultural exports. Imports are mostly out-of-season vegetables or products of a kind not grown in Canada. With steadily rising population and per capita real incomes, it must be expected that Canadian demand for products such as citrus fruits and plantation crops will continue to grow.

Farmers are important taxpayers, both on property and personal income taxes. Property taxes paid by farmers in 1968 were estimated at \$175 million. In addition, rentals, in cash or in kind, amounted to an estimated \$130 million. These two items together represented 11 per cent of farm operating expenses (23). Information for the most recent year available (1965) indicates that the number of persons classified as farmers by the Department of National

Revenue and subject to tax was 119,500 or about one-third of all persons classified as farm operators by the labor force survey in the same year. Total personal income tax payable by farmers to all levels of government was \$60.6 million or 2 per cent of the total income tax payable. Average tax paid was \$500, the same as the average tax paid by all taxpayers (24). The number of corporate taxpayers whose chief source of income is the sale of agricultural commodities is relatively small—only about 3,000 (25). In 1966, these corporations (excluding cooperatives and other exempt corporations) reported sales of products and services of \$328 million. Fixed assets per corporation averaged \$95,600, income \$116,000, expenses (including wages, salaries and depreciation) \$111,000, leaving a net profit per corporation of \$5,000.

The agricultural sector is an important source of growth for economic development. This is particularly true for developing countries but it is also true for a recently matured economy such as the Canadian one. Agricultural output in Canada has been increased using an ever-smaller labor force, thereby contributing significantly to the growth of national productivity. Productivity (net output per man) for all commercial industries in Canada has increased at a rate of 3.5 per cent per year since 1946 (26). On the basis of a classification into 7 broad industry groupings, the growth rate for agricultural productivity has been the highest at 5.5 per cent per year. This is the result of an annual increase in net output of 1.7 per cent and a decrease in the agricultural labor force of 3.6 per cent per year. Since 1961, while the growth rate in productivity for all commercial industries declined to 2.9 per cent per year, that for agriculture increased to 6.5 per cent. By comparison, productivity growth rates for manufacturing were 3.7 per cent per annum since 1946 and 3.6 per cent since 1961.

The rapid growth in output per worker in agriculture can also be shown in terms of the number of persons the gross output of Canadian farms would "support" with food and fibre (27). In prewar years, the food and fibre produced by one farm worker in Canada would support the equivalent of 11 persons. Today, the number is 42 persons. These changes have come about largely because of the substitution for labor of capital inputs although part of the increase in gross output for the market is also due to the substitution of mechanical power for farm-raised power.

As in most developed countries, consumers' expenditures on food in Canada are a relatively small proportion of their total outlays. Most recently (1967), it has been about a fifth as compared with

TABLE 3—AMOUNT OF FOOD THAT AN HOUR'S WAGES IN THE MANUFACTURING INDUSTRIES WOULD BUY AT RETAIL, CANADA, 1948 AND 1968

Food Item	Unit	1948		1968	
		Retail Price	Amount an Hour's Wages (92¢) Would Buy	Retail Price	Amount an Hour's Wages (258¢) Would Buy
		cents		cents	
Milk, fluid.....	quart	17.3	5.3	30.7	8.4
Eggs, grade A, large.....	dozen	59.7	1.5	55.6	4.6
Beef, sirloin steak.....	pound	62.4	1.5	126.5	2.0
Pork, rib chops.....	pound	52.2	1.8	88.2	2.9
Flour, white, all purpose.....	pound	6.1	15.1	12.0	21.5
Bread, plain, white, wrapped, sliced.....	pound	9.3	9.9	19.6	13.2
Sugar, granulated.....	pound	9.1	10.1	9.4	27.4
Potatoes, No. 1 table.....	10 pounds	40.4	2.3	62.7	4.1

Sources: *Prices and Price Indexes*, Cat. No. 62-002, Monthly, various issues, Dominion Bureau of Statistics. Retail prices given are all-Canada averages. Food items are fresh (i.e., not frozen or processed). Average wages are from *Earnings and Hours of Work in Manufacturing*, Cat. No. 72-204, Annual, Dominion Bureau of Statistics. Also given in the *Canadian Statistical Review*, Cat. No. 11-003, Monthly, Dominion Bureau of Statistics.

over a quarter in the immediate postwar years (28). The declining proportion which consumers spend on food means that a greater proportion of their total income is available for other consumption goods or for saving and investment. This is one of the ways in which an efficient agriculture can contribute to economic growth.

Consumer expenditures on food have declined relatively for two reasons—rising per capita real incomes and relatively smaller increases in food costs than in non-food costs. The Consumer Price Index has shown an overall increase of 36 per cent from 1948-52 to 1964-68. The increase in the food portion has been 33 per cent (29). However, much of this increase in the retail price of food has not been due to price increases of the raw materials used. The increase in farm product prices at the farm level over the same time period has been only 9 per cent (30), while at the wholesale level, the increase in the price index for farm products was 4 per cent (29). Estimates of the farm-retail marketing bill for domestically produced foods indicate that the farm value as a per cent of the retail value has declined from 60 per cent in 1949 to 43 per cent throughout the 1960's (31). Part of this change is due, of course, to the changing nature of the consumer food basket wherein foods with a higher processing content have increased in relative importance (32). The relatively smaller rise in retail prices of food as compared with the increase in consumer incomes can also be shown in terms of what an hour's wages will purchase of selected food items (Table 3). Thus, in 1948, an hour's wages in the manufacturing industries would buy, for example, one and a half dozen eggs (Grade A, Large) or one and a half pounds of sirloin steak.

In 1968, an hour's wages would buy over four and a half dozen eggs or two pounds of sirloin steak. Thus, despite the increased cost of convenience packaging, food costs to the consumer, primarily because of increased efficiency in the production of domestic foodstuffs and the highly competitive nature of the industry, have declined relatively.

The agricultural sector is an important source of growth, as it was noted previously, for developing countries. In this respect, Canada has considerable to offer in the way of aid, both of a short-term nature such as food aid and of a longer-term nature such as technical assistance and education. In 1967-68, Canada's international aid expenditures on a net basis were equal to about 0.6 per cent of National Income (33). Food aid represented about a fifth of total aid, with India being the largest single recipient. Agricultural students and trainees coming to Canada have represented about six per cent of all trainees. However, with the establishment of more universities and technical schools in the developing countries, more emphasis is to be given in the future to training students in their own countries. To this end, Canada has sent abroad a large number of technical advisers in the agricultural sciences.

CANADIAN AGRICULTURE IN THE WORLD ECONOMY

Canada is one of the world's largest trading nations and agricultural trade is an important component of this country's trade. On the average about two-thirds of Canada's total wheat production, for

example, goes to export markets. Other major agricultural commodities exported are: oilseeds, mainly flaxseed and rapeseed; live animals, meat and meat products; and raw tobacco. Canada, even though it occupies the northern half of the North American continent with its severe climatic limitations, in fact produces most of the products found in the United States with the principal exceptions of citrus fruits, cotton and sorghums. Thus, if Canada is to compete successfully with U.S. farmers and others in world markets, agriculture in this country must be as technologically efficient, or more so, than in competing countries. In this respect, yields of spring wheat in Canada, for example, are equal to yields in the U.S. spring wheat area. Grain corn yields in southern Ontario are equal to or better than yields in U.S. states in the same latitudes (34).

Since primary agriculture is still largely an industry of small businesses as compared with non-farm firms in most western countries, governments of these countries provide support for research, extension, price stability and other measures. In this respect, Canada is no exception but the level of support is one of the lowest in the western world. OECD studies shed some light on the subject. Federal expenditures on agriculture in Canada average about \$286 per active person in farming compared with \$1,287 for U.S. agriculture (35).

In terms of production costs, it has been estimated that Canada enjoys an absolute cost advantage in wheat production over other major wheat exporting countries (36). This ranged, for example, from 7 to 31 cents a bushel over U.S. producers for the first half of the 1960's. In meat production, Canada's main cost advantage, according to the foregoing study, was in feeder cattle production. In fruit and vegetable production, the United States generally has an advantage over Canada, principally because of climatic factors. However, in selected cool climate crops, Canadian producers have an overall cost advantage.

SUMMARY AND CONCLUSIONS

The purpose of this paper has been to show the contribution of the farming industry, together with associated supply, processing and distributive services, to the Canadian economy. In brief, it was noted that there are about 430,500 census farms in Canada but only about 100,000 of these are commercial in the sense that they provide the main source of income for the operator. The most important types of farms are wheat and livestock farms. Total investment in

the primary agricultural industry is over \$22 billion or about \$41,000 per worker.

The most important single change which has faced the farming industry in the past two decades has been the substitution of purchased inputs from the non-farm sector for non-purchased inputs. This has been reflected particularly by the decrease in the size of the farm labor force, down by one-half during the period. This has been an important source of overall Canadian productivity (output per man) growth. This change has meant, however, that many tasks formerly done by farmers themselves are now done in the non-farm sector. This applies to operations such as the processing of farm products, the servicing of farm equipment, the grinding and mixing of feeds. There appear to be almost as many persons outside the primary farming industry that are dependent upon agriculture for their livelihood as there are in farming itself.

Primary agriculture contributes about 5 or 6 per cent to Gross Domestic Product and this proportion has been relatively stable since 1957. Employment in the farm sector is about 7 per cent of total employment.

Canadian export trade in farm products contributes over \$1 billion to the balance of payments, exceeding the value of imports of farm products. Wheat and wheat flour represent over a half of total agricultural exports.

The Canadian climate imposes severe limitations for agricultural production. Furthermore, the main export-producing areas are located in mid-continent creating a heavy transportation cost. However, those products that Canada sells abroad are produced in this country at competitive costs. The large inputs of public research and the managerial knowhow of Canadian farmers have made this possible. Even so, the level of public support for agriculture in Canada appears to be less than that in most other western nations.

In this review of the importance of Canadian agriculture, it is perhaps obvious that its greatest strength in the past is likely to be its greatest weakness in the future. Greater production of food and feed grains in many parts of the world and a declining per capita demand in western nations for bread grains, especially wheat, increase the competition for available markets. While short-term changes such as crop failures abroad can alter the outlook sharply, the longer-run outlook for the industry would appear to be a need for greater product diversification and a tailoring of output more in terms of the market demand of the North American consumer.

NOTES AND REFERENCES

- (1) J. M. Fitzpatrick and C. V. Parker, "Distribution of Income in Canadian Agriculture," *Canadian Journal of Agricultural Economics*, Vol. XIII, No. 2, 1965, pp. 47-64. Based on data for 1958, the authors report that farm net income as a proportion of total farm family income ranged from as little as one per cent for those "farms" selling less than \$250 worth of products in a year to 90 per cent for those selling \$25,000 and more. See Table 6.
- (2) For example, a recent study (May 1969) by the Poultry Branch of the Alberta Department of Agriculture indicates that the costs of three items (chicks, feed and labor) comprise 84 per cent of the total cost per bird in broiler production.
- (3) *1966 Census of Canada: Agriculture*, Cat. No. 96-601, p. v, Dominion Bureau of Statistics.
- (4) Occupation is determined by "chief source of income". For example, a lawyer or doctor whose chief source of income is salary is classified as an "employee". See: *Twenty-one Million Dollars a Day*, Cat. No. Rv 41-1366, pp. 56-57, Ottawa, 1966, Taxation Division, Department of National Revenue.
- (5) A "commercial" census farm was defined for the 1966 Census of Agriculture as a census farm with value of sales of agricultural products during the 12-month period prior to the census at June 1 of \$2,500 or more. The term "commercial" is used more as a statistical convenience than in the usual sense of the word. See: *Census of Canada: Agriculture*, Cat. No. 96-601, Table 16, Dominion Bureau of Statistics.
- (6) *Quarterly Bulletin of Agricultural Statistics*, April - June, 1969, Cat. No. 21-003, Dominion Bureau of Statistics. *The Labour Force*, Cat. No. 71-001, Table 2, Dominion Bureau of Statistics. The annual estimate of 546,000 workers in agriculture was divided into the estimated total owned capital investment of \$22,378,371,000. This estimate excludes Newfoundland.
- (7) *1966 Census of Canada: Agriculture*, Cat. No. 96-601, Table 4, Dominion Bureau of Statistics.
- (8) *National Accounts: Income and Expenditure*, Fourth Quarter and Preliminary Annual 1968, Cat. No. 13-001, Quarterly, Table 22, Dominion Bureau of Statistics.
- (9) R. S. Rust, "Farm Credit Reviewed", *Canadian Farm Economics*, Vol. 3, No. 4, October 1968, pp. 13-17.
- (10) *The Labour Force*, Cat. No. 71-001, Monthly, various issues, Tables 2 and 6, Dominion Bureau of Statistics.
- (11) I. F. Furniss, "Trends in Agricultural Productivity", *Canadian Farm Economics*, Vol. 2, No. 1, April 1967, pp. 15-21.
- (12) In 1966, employment in the farm sector was 544,000 which added to employment in the sectors listed of about 338,000 totals 882,000 persons. Total employment in the same year was 7,152,000 persons. Source of employment data: Reference (10).
- (13) *Canada Year Book 1968*, Table 4, p. 798, Dominion Bureau of Statistics. Figures used are for the year 1966 and are a total of "agricultural products" (35,165,635 tons) plus "animal products" (1,361,228 tons) equals 36,526,863 tons or 17.8 per cent of the total railway commodity freight of 205,511,067 tons in 1966. The total includes both carload lots and less-than-carload lots.
- (14) *Canada Year Book 1968*, Table 14, pp. 833-834, Dominion Bureau of Statistics. Ratio given is for the year 1967. Total tonnage of "agricultural products" and "animal products" was 15,964,429 tons or 26.1 per cent of the total of 60,923,456 tons. This refers to combined traffic of the Montreal-Lake Ontario section and the Welland Canal with duplication eliminated.
- (15) Figure given refers to 1966 data. Farm purchases of gasoline, diesel oil and lubricants were estimated to be \$247,535,000 in that year. (*Farm Net Income, 1967*, Cat. No. 21-202, Dominion Bureau of Statistics). On the basis of an estimated average farm price (author's estimate) of 32.6 cents a gallon (33.5 cents for gasoline and 22.6 cents for diesel fuel weighted in a ratio of 92 per cent for gasoline and 8 per cent for diesel fuel) then the number of gallons was about 759.3 million gallons, equal to 16.6 per cent of the total sales of motive fuels of 4,561.8 million gallons in the same year of gasoline, liquified petroleum gases and diesel oil. (*Canada Year Book 1968*, Table 8, pp. 815-816, Dominion Bureau of Statistics.)
- (16) Figures given refer to 1967 data. R. S. Rust, "Farm Credit Reviewed," *Canadian Farm Economics*, Vol. 3, No. 4, October 1968, Table 1.
- (17) Figures given refer to 1961 data. See Table 2 for explanatory note and source.
- (18) Ray A. Goldberg, *Agribusiness Coordination: A Systems Approach to the Wheat, Soybean and Florida Orange Economies*, Harvard University, Boston, 1968, p. 10, Table II-2.
- (19) The Standard Industrial Classification (1960) describes "agriculture" as "all land holdings primarily engaged in agricultural production. In addition, it also includes establishments primarily engaged in providing services to agriculture such as animal husbandry services, horticultural services; contract sorting, grading and packing of farm produce; orchard spraying; fruit picking; harvesting and ploughing." See: *Standard Industrial Classification Manual*, Cat. No. 12-501, Occasional, Ottawa, December 1960, Dominion Bureau of Statistics. The Gross Domestic Product (G.D.P.) of agriculture refers to the income of farm operators from farm production plus the imputed value of farm output consumed by farm families, plus or minus the value of the physical change in farm inventories of crops and livestock, less farm operating expenses and capital consumption allowances. To this total is added the value of government transfer payments to the agricultural sector. The result is a mixture of labor and investment income. See: *National Accounts: Income and Expenditure, 1926-1956*, Cat. No. 13-502, Dominion Bureau of Statistics.
- (20) *National Accounts: Income and Expenditure*, Cat. No. 13-201, Annual, various issues, Dominion Bureau of Statistics. Gross Domestic Product refers to production within the geographic boundaries of Canada. It is a net measure of output (value added). See Note (19).
- (21) *The Labour Force*, Cat. No. 71-001, Monthly, Table 5, various issues, Dominion Bureau of Statistics.
- (22) *Trade in Agricultural Products*, various reports, Economics Branch, Canada Department of Agriculture.
- (23) *Farm Net Income, 1968*, Cat. No. 21-202, Annual, June 1969, Dominion Bureau of Statistics.
- (24) *Canada Year Book 1968*, Table 16, p. 1036, Dominion Bureau of Statistics.
- (25) *1966 Corporation Financial Statistics*, Cat. No. 61-207, Annual, Table 3, pp. 48-49, Dominion Bureau of Statistics.
- (26) *D B S Daily*, Cat. No. 11-001, April 18, 1969 and October 28, 1968, Dominion Bureau of Statistics.
- (27) This statistic expresses the gross value of agricultural production in terms of the total population it would

support on the basis of the per capita domestic disappearance of farm products. The ratio for Canada may be arrived at from the following accounting identity:

$$R = F^{-1}(PA)(A + B - C)^{-1}$$

where: R = number of persons supported by one farm worker;

A = gross value of agricultural production;

B = imports of agricultural commodities;

C = exports of agricultural commodities;

P = total population at June 1; and

F = total farm labor force.

Data given in the text refer to the 1935-39 and the 1966-68 averages. To obtain the number of persons supported by one farm worker *in addition to himself*, one person is subtracted from the given ratios.

- (28) *National Accounts: Income and Expenditures*, Cat. No. 13-201, Annual, various issues, Dominion Bureau of Statistics. See Table 47 in the 1967 issue.
- (29) *Prices and Price Indexes*, Cat. No. 62-002, various issues, Dominion Bureau of Statistics.
- (30) *Index Numbers of Farm Prices of Agricultural Products*, Cat. No. 62-003, Monthly, various issues, Dominion Bureau of Statistics.
- (31) K. E. Cann, "Marketing Bills," *Canada Agriculture*, Vol. 14, No. 3, Summer 1969, pp. 11.
- (32) Zenon Yankowsky, "Agricultural Demand and Supply Projections for 1980," *Canadian Farm Economics*, Vol. 3, No. 6, February 1969, pp. 11-17.
- (33) Canadian International Development Agency, *Annual Review 1967-1968*, Cat. No. E94-468/1, pp. 11, 33, 36-38, Ottawa, 1968.
- (34) Based on a comparison of average yields for the period 1961 to 1967 from United States Department of Agriculture and Dominion Bureau of Statistics crop statistics. Average spring wheat yields in Manitoba, Saskatchewan and Alberta were compared with those in Minnesota, North Dakota and Montana. Grain corn yields in southern Ontario were compared with those for Michigan, Wisconsin, Minnesota and Iowa.
- (35) In Canadian dollars. Data refer to 1966-67 or 1967-68 fiscal years.
- (36) G. A. MacEachern and D. L. MacFarlane, "The Relative Position of Canadian Agriculture in World Trade", *Proceedings of the Conference on International Trade and Canadian Agriculture*, Banff, 1966, Cat. No. EC 22-766, Economic Council of Canada and Agricultural Economics Research Council of Canada, Ottawa, 1966.

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SOME HIGHLIGHTS OF A SURVEY OF INCORPORATED FAMILY FARMS IN ONTARIO

R. A. Stutt

Current trends in the changing structure and organization of agriculture include commercialization, specialization, farm consolidation and enlargement. Farming is an extremely competitive industry and farmers are under constant pressure to increase the size and efficiency of their businesses. Obtaining capital and credit to make periodic changes oftentimes is a problem. In addition, transferring the farm property to the next generation as a farm unit is becoming increasingly difficult. Management problems appear impressively large during these stages. Some farmers and their families successfully make planned expansions and establish profitable units on a continuing basis but many are unable to make adjustments.

There are signs of an increasing interest in incorporation as a method of making structural changes in the farm business and of passing the farm to the next generation. In Canada, the number of incorporated farms increased from about 1,700 in 1962 to about 3,000 in 1966 (1). However, they still represented less than 1 per cent of the total farms. In the United States, recent surveys showed that the extent of farm incorporation is similar to that in Canada (2) (3).

An agricultural economist in the United States points out that economic, social and technological pressures are forcing large commercial family farms and corporate farms into existence and this will continue regardless of legislation and other barriers to stop them (4). He notes that modern agriculture requires large investments, continuous capital sources, top management and a new dimension of economies of size to achieve new competitive advantages in the cost of operation, and shows that the move towards large commercial farms, such as through a corporate organization, is underway.

To get an insight into the operating arrangements of family farms in Ontario under a corporate form of organization, a survey was made by the Economics Branch in July 1968. The study was of a preliminary and exploratory nature and was restricted to family farm corporations or closely held types as opposed to publicly held corporations. It was confined to four main types of farms found in Ontario: beef cattle-hogs, dairy, poultry and cash crops. The sample included 33 farms, of which 7 were located in Eastern Ontario and 26 in Southwestern Ontario. The scope of the study included the features of corporate structure, conditions determining the economic and social feasibility of family farm incorpora-

tion, and the suitability of this type of business organization to farming in Ontario. The results must be viewed as tentative largely because of the extent of the investigation.

RESULTS OF THE STUDY

The respondents expressed an opinion that incorporation was the most desirable form of group business arrangement from the standpoint of stability and benefits. Forty-two per cent had contemplated forming a partnership but passed it over as being unsuitable to their situation. Almost three-quarters of the farms studied were incorporated after 1960, with more than half during the 1961-65 period (Table 1).

There was a relatively wide range in the number of years the farms in the study had been established before becoming incorporated (Table 2). The dairy and cash crop farms had been established for an average of about 33 years, and the beef-hogs and the poultry farms for about 25 years.

TABLE 1—INCORPORATION OF FARMS BY STARTING PERIOD

Period of Incorporation	Number of Farms	Per Cent
1946-1950.....	1	3.0
1951-1955.....	—	—
1956-1960.....	8	24.2
1961-1965.....	18	54.5
1966-1968.....	6	18.3
Total.....	33	100.0

TABLE 2—LENGTH OF FARM OPERATION PRIOR TO INCORPORATION ACCORDING TO FARM TYPE

Farm Type	Length of Operation		
	Longest	Shortest	Average
	years		
Beef cattle-hogs ^a	103	3	25
Dairy.....	50	12	32
Poultry.....	48	2	23
Cash crops.....	80	9	33

^a Omitting one farm which was not in operation prior to incorporation.

Reasons for Incorporation

A relatively large number and wide variety of reasons for incorporation were given by farmers. These were arranged into seven main headings as shown in Table 3.

Although farmers gave a variety of reasons for incorporation there were three main concerns. These were (1) assurance of an adequate estate for the founder or principal member on retirement, (2) transfer of the farm to the next generation without interruption or undue disruption of the farm business, and (3) a desire for improved farm efficiency. The benefit to sons was an important reason for incorporation. Satisfaction gained by the sons include some assurance of their position with respect to asset allocation of the estate, management and farm operations, and returns. It provides an incentive for them to stay in farming and to be compensated for their labor.

Another important reason for incorporation was the perpetual aspect associated with a company. This tends to avoid any hold-up in the farm operations and plans of the company or change in investment due to the death of one or more shareholders. Related to this aspect was the desire of the principal member or father to legally arrange for a gradual transfer of his estate to his heirs and particularly a transfer of eventual control of the farm business to sons desiring to continue the operation of the farm. At the same time, the principal member usually wanted to retain control during the period when the son or sons were acquiring proficiency in farm management.

The aspect of limited liability of each shareholder was another common reason given for incorporation. However, in practice this seldom held for the principal shareholder. When raising capital to carry on farm operations the father usually had to personally guarantee any loan. More than half (51.5 per cent) of the principal members personally guaranteed repayment of loans. Contrary to expectations most

incorporated farms found that incorporation did not make it easier to obtain credit.

The possibility of lessening the impact of estate tax and succession duties was given as a main benefit expected from incorporation. However, little evidence was available on the actual benefits to be derived and considerable uncertainty appeared to exist in this respect.

Sources of Professional Advice

Only about 12 per cent of the members of these farm family corporations had prior corporation experience. Lawyers were consulted for professional advice about incorporation by four-fifths of the farmers and accountants by three-quarters. Bankers were consulted by one-fifth and an educator group, including agricultural representatives, by 15 per cent.

Sources of Credit

The efficient operation of a farm requires a large amount of capital. Incorporation does not change the need for capital as compared with individual farm operation. It was not surprising, therefore, to find that almost all respondents had obtained loans following incorporation. Almost 95 per cent had borrowed from a bank; 70 per cent had obtained a loan from the Farm Credit Corporation; 6 per cent had borrowed from the Industrial Development Bank; and 9 per cent had obtained a loan through the Ontario Junior Farmers Establishment Loan Corporation. Only a fifth of the farmers said their creditors required the filing of a financial statement before granting credit. About 58 per cent reported little change in their ability to obtain credit as compared with their experiences under private farm operation.

Farm Changes Under Incorporation

Fifty-five per cent of the farmers increased the size of the farm area after incorporation, 42 per cent reported no change and 3 per cent reported a decrease. The beef cattle-hog farmers reported the smallest average increase in total farm acres (Table 4).

About one-third of the increase in farm size following incorporation was obtained by renting and two-thirds by land purchase. Poultry farmers obtained all of their increased land by purchase compared with 71 and 65 per cent by beef cattle-hog, and dairy farmers, respectively. Cash crop farmers obtained 79 per cent of their increased area by renting (Table 5).

TABLE 3—REASONS FOR FAMILY FARM INCORPORATION

Reasons	Per Cent Reporting
1. Estate tax and succession duties.....	60.6
2. Incentive to sons.....	51.5
3. Aspect of continuity and perpetuity.....	42.4
4. Income tax advantage.....	27.3
5. Ease of land transfer.....	21.2
6. Limited liability.....	18.2
7. Aid to capital expansion.....	18.2
Number of corporations in survey.....	33

TABLE 4—AVERAGE SIZE OF FARM AT INCORPORATION AND IN 1968 BY FARM TYPE

Farm Type	Total acres per farm		Percentage Change
	At Incorporation	In 1968	
Beef cattle-hogs*	298.4	369.4	+ 23.8
Dairy	207.7	389.0	+ 45.3
Poultry	116.1	257.6	+121.9
Cash crops	231.1	342.6	+ 48.2
All types	231.6	343.7	+ 48.4

* Omitting the farm which was not in operation prior to incorporation.

TABLE 5—PERCENTAGE INCREASE IN FARM SIZE DUE TO PURCHASE OR RENTING

Farm Type	Purchased	Rented
	per cent	
Beef cattle-hogs	71.1	28.9
Dairy	65.2	34.8
Poultry	100.0	—
Cash crops	21.1	78.8
All types	64.4	35.6

TABLE 6—AVERAGE CHANGE IN LIVESTOCK UNITS SINCE INCORPORATION BY FARM TYPE

Farm Type	At Incorporation	In 1968	Percentage Change
	animal units per farm		
Beef cattle-hogs	178.7	338.1	+89.2
Dairy	69.8	106.8	+53.1
Poultry	342.8	582.1	+69.8
Cash crops	16.0	18.4	+14.8

The farms in this study were considerably larger than the average commercial farm in Ontario. The average size of the sample incorporated farms in 1968 was 344 acres compared with an average of 187 acres for Ontario commercial farms reported in the 1966 Census.

Following incorporation about 40 per cent of the farmers intensified the livestock enterprise through increases of one particular class of livestock; beef cattle, dairy cattle, hogs or poultry, whereas 24 per cent diversified through increases in a combination of classes. The largest percentage increase took place in the beef cattle-hog farms, followed by decreasing proportions on poultry farms, dairy farms and cash crop farms. Average changes in livestock units since incorporation by farm type are shown in Table 6.

All types of farms in this study reported an increase in gross farm income in 1967 compared with the years before incorporation of the farm business. The average annual gross income before incorporation was estimated at \$75,837, the 1967 gross income of the farms was \$195,209, an increase of 157 per cent. The largest estimated increase was made by poultry farmers, followed by dairy farmers, beef cattle-hog farmers, and the least by cash crop farmers (Table 7).

Much of the increase in gross income could be attributed to the increase in the physical size of the farm business. Other influencing factors included: (1) consolidation of two or more farm units into one company farm (18 per cent of the farms had been formed in this way) permitting some economies of scale, and (2) after incorporation usually more than one family was dependent on the income from the new business organization, providing an incentive for more income to provide a higher standard of living.

The estimated gross annual income in 1967 reported in this survey for incorporated farms was considerably higher than incomes shown for individually owned and operated farms in the Ontario farm management and accounting project (Table 8).

Related Non-Farm Activities

Farm companies may be incorporated under a federal or provincial charter. The objects of the company must be stated when application is made for incorporation; farmers are usually advised to state the objects broad enough to encompass any anticipated activity. Generally, these activities include areas other than those associated with farm production, such as sales of farm supplies and inputs and processing, packaging and marketing of farm products either in their present or modified form.

Information on the kinds of objects included in the application for incorporation, or of the non-production activities actually carried on by the

TABLE 7—ESTIMATED GROSS ANNUAL INCOME OF FARMS AT INCORPORATION AND IN 1967, BY FARM TYPE

Farm Type	At Incorporation	1967	Percentage Increase
	dollars per farm		
Beef cattle-hogs.....	93,714	184,667	+ 97.0
Dairy.....	22,444	53,556	+138.6
Poultry.....	107,857	420,428	+289.8
Cash crops.....	79,333	122,188	+ 54.0
All types.....	75,837	195,209	+157.4

TABLE 8—GROSS INCOME AND TILLABLE LAND AREA PER FARM, SOME FARMS IN THE ONTARIO FARM MANAGEMENT AND ACCOUNTING PROJECT, 1967

Type of Farm	1967 Gross Farm Income	Tillable Land Area
	dollars	acres
General beef feeder farms (2 high income).....	74,605	417
General swine farms (5 high income).....	39,424	315
Large specialized fluid milk farms (19 high income).....	40,435	217
Poultry farms (2 high income).....	49,198	101
General cash crop farms (3 high income).....	40,749	159
Large mixed farms (9 high income).....	58,027	161

Source: *Summary Report Ontario Farm Management and Accounting Project 1967*, Pub. 315, Ontario Department of Agriculture and Food, Toronto.

farmers in the sample was not obtained. About two-fifths (39.4 per cent) of the incorporated family farms in this study had objects in their charter permitting a widening of company operations beyond farm production. Over half (55.6 per cent) of the cash crop farmers had other non-farm production objects compared with 44.4 per cent of the dairy farmers, 28.6 per cent of the poultry farmers and 25.0 per cent of the beef cattle-hog farmers.

Forty-nine and 37 per cent of the corporation farms in the neighbouring States of New York and Pennsylvania reported having objects beyond farm production (1) (2). About 39 per cent of incorporated farmers in the United States had business operations outside of farming in the order of (1) business activities unrelated to production of agricultural products, and (2) agribusiness, such as sales of farm supplies and the processing and marketing of farm products.

Aside from the farm activities and related businesses, the survey in Ontario showed that 42 per cent of the principal members had other financial assets and income. These included such non-farm items as stocks, directorships and part-ownership in other ventures.

Business Management

Two-thirds of the respondents said that incorporation had significantly increased the task of keeping accounts. Almost half (48.5 per cent) of the companies used the services of a qualified accountant for this purpose. They said this was necessary because of the amount of bookkeeping required by an operation of relatively large scale employing several persons. The government requirements for payment toward unemployment insurance and pension plans, together with income tax payments and other employee benefits, add to the administration tasks of a farm corporation.

Other prominent reasons for keeping farm accounts were the financial knowledge, administrative experience, and management aids to be gained periodically throughout the year. This was believed to be extremely useful for decision making and as a guide to farm business management and operations. Respondents definitely believed that incorporation and the associated administrative duties had helped to improve their financial and management abilities. Some were considering further business and agricultural education as a means of enhancing their abilities.

Because of the separation of ownership, management and control in a corporate farm operation, one could expect a greater measure of business formality as compared with a privately owned farm business. The survey shows, however, that apart from the actual incorporation of the farm very little in the way of corporate business procedure was used. In most cases the father directed the farm operations and business arrangements with a moderate amount of involvement by the sons or other members of the corporation. Usually sons of the principal member participated in the management of the farm in the capacity of apprentice or learner rather than of a director. The sons often suggested new or different methods but the decision on what to use or do was usually finalized by the father. The main weight of the decision came from the principal member as was the practice before incorporation.

One important business management change following incorporation was related to the distribution of returns from the farming operations. Prior to incorporation the normal practice was to withdraw moneys from the business on an irregular basis. Under incorporation a regular method was followed whereby a monthly salary was paid to all members at an agreed wage level. This was a substantial change and necessitated a financial review at regular intervals throughout the year. It provided a measure of regularity of income distribution which was seldom experienced in the past. The end-of-year surplus was either applied to financial obligations, capital reserve, or distributed as a dividend or bonus to the shareholders.

CONCLUSION

There appears to be an increasing interest in incorporation of family farms in Ontario. With the limited information at hand it is not possible to be conclusive as to its full significance and eventual status. The survey does suggest, however, the likelihood of an expansion in numbers of incorporated family farms and that the process can help the principal member of the corporation and his family to obtain benefits more commensurate with their goals and objectives.

ACKNOWLEDGEMENTS AND REFERENCES

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- (4) Staniforth, S. D., *Economic Considerations in the Probable Future Form of Business Organization in Farm Production*, Department of Agricultural Economics, University of Wisconsin, Staff Paper Series No. 24, August 1968.
- (5) Mr. R. C. Biggs assisted in the development of the questionnaire, conducted the enumeration through interviews with representatives of the family farm corporations, and carried out the tabulation and analysis of the primary data. Acknowledgement is extended to Mr. Biggs and to the farmers providing the basic information.

REGIONAL COMPARISONS OF DEATH RATES OF FARM ANIMALS IN CANADA

W. Y. Yang

This article reports some results of a statistical analysis of death rates of farm animals in the various regions of Canada (1). It deals primarily with regional comparisons of the magnitudes, variations, and long-range trends of the annual death rates of cattle, swine, and sheep and lambs (2).

Cash receipts from the sale of livestock and dairy products are more than 45 per cent of the total cash receipts of Canadian farmers. To better understand the problems of livestock production, and for formulating policies to improve the productivity, to reduce the losses and to ensure development of the livestock economy there has been a need for information on death rates of farm animals. It was to meet the need for such data by veterinarians, farm management advisors, and various private and public agencies that this analysis was undertaken.

Data on the number of deaths of farm animals were provided by the Dominion Bureau of Statistics from unpublished data obtained in semi-annual livestock surveys beginning in 1950 (3). These semi-annual surveys are for June 1 and December 1. Livestock inventory numbers were obtained from various published reports of the Dominion Bureau of Statistics (4).

Death rates were calculated on an annual basis and on semi-annual bases. In the calculation of the semi-annual death rates, the number of deaths during the six months of December through May was divided by the number of animals on farms at the beginning of the period, that is, December 1. The number of deaths during the six-month period June through November was divided by the number of animals on farms on June 1. To avoid the defects of combining two death rates derived from two different bases, the annual death rate was calculated by dividing the total number of deaths in the 12-month period, De-

cember through November, by the average of the numbers of animals on farms on December 1 and June 1 (5).

Annual Death Rates

Quebec led all other regions by having the highest average rate of cattle deaths a year, 52 per 1,000 cattle on farms (average of December 1 and June 1), compared with 45 deaths per 1,000 cattle for Canada as a whole (Table 1). The Atlantic region had the lowest rate of cattle deaths, about 38 per 1,000 and British Columbia showed the second lowest, about 42 per 1,000.

Differences in the annual death rates of all cattle between the various provinces or regions were statistically very significant with the exceptions of those between Ontario and the Prairies and between the Prairies and British Columbia.

Of 1,000 head of all cattle on farms in Canada (average of December 1 and June 1), more than 31 calves died annually during the 17 study years. This compares with an average annual death rate of 13.5 per 1,000 cattle over 1 year old.

Quebec and Ontario had the highest death rates of calves, 39 and 32 per 1,000 of all cattle. British Columbia had the highest death rate for cattle over 1 year old, about 16 per 1,000. Quebec and the Prairies had about 14 per 1,000.

Ontario and Quebec had the highest average annual death rates of swine in Canada, about 80 per 1,000. For Canada as a whole, it was 74 per 1,000. British Columbia had the lowest annual death rate at about 62 per 1,000.

The average death rates of sheep and lambs were higher than those for cattle and swine. Quebec again led all regions by having the highest death rate, 169

TABLE 1—AVERAGE ANNUAL DEATH RATES PER 1,000 OF FARM ANIMALS IN CANADA BY REGIONS, DECEMBER 1950 TO NOVEMBER 1967

Region	Cattle			Swine	Sheep and Lambs
	All	Calves	Over 1 year old		
Canada.....	44.95	31.43	13.52	74.33	127.63
Atlantic.....	37.85	27.04	10.64	66.83	138.53
Quebec.....	52.33	38.53	13.80	78.58	169.38
Ontario.....	45.12	32.36	12.76	80.96	145.62
Prairies.....	44.05	29.88	13.94	68.08	107.37
British Columbia.....	41.87	26.30	15.57	62.41	93.19

TABLE 2—AVERAGE SEMI-ANNUAL DEATH RATES, DECEMBER THROUGH MAY, PER 1,000 OF FARM ANIMALS IN CANADA BY REGIONS, 1950-1967

Region	Cattle				Sheep and Lambs
	All	Calves	Over 1 year old	Swine	
Canada.....	28.80	21.24	7.57	37.05	107.63
Atlantic.....	22.46	16.74	5.72	31.69	133.43
Quebec.....	37.68	29.40	8.28	40.44	162.46
Ontario.....	25.33	19.07	6.27	39.99	121.06
Prairies.....	28.97	20.64	8.21	33.76	84.67
British Columbia.....	24.54	15.94	8.60	30.72	74.00

TABLE 3—AVERAGE SEMI-ANNUAL DEATH RATES, JUNE THROUGH NOVEMBER, PER 1,000 OF FARM ANIMALS IN CANADA BY REGIONS, 1950-1967

Region	Cattle				Sheep and Lambs
	All	Calves	Over 1 year old	Swine	
Canada.....	16.77	10.74	6.02	37.34	34.16
Atlantic.....	15.60	10.49	5.11	35.36	30.43
Quebec.....	16.11	10.40	5.70	38.27	37.25
Ontario.....	19.82	13.33	6.49	41.13	41.09
Prairies.....	15.93	9.84	5.88	34.28	31.00
British Columbia.....	17.64	10.65	7.04	31.76	29.53

TABLE 4—STANDARD DEVIATION^a OF ANNUAL DEATH RATES PER 1,000 OF FARM ANIMALS IN CANADA BY REGIONS, DECEMBER 1950 TO NOVEMBER 1967

Region	Cattle				Sheep and Lambs
	All	Calves	Over 1 year old	Swine	
Canada.....	1.273	1.086	0.346	8.41	8.597
Atlantic.....	1.718	1.300	0.949	10.54	14.742
Quebec.....	5.095	4.550	1.269	15.60	27.391
Ontario.....	3.200	2.439	1.072	13.58	11.832
Prairies.....	2.550	1.905	0.520	6.44	10.298
British Columbia.....	3.705	3.189	1.315	17.90	19.139

^a Standard deviation measures the yearly variations of the annual death rates from the average annual death rate and in about 2/3 of the 17 years the annual death rates vary within a range of one standard deviation above and below the average annual death rate of the respective type of animals.

TABLE 5—YEARLY INCREASE (+) OR DECREASE (−) IN THE TREND OF DEATH RATES OF FARM ANIMALS IN TERMS OF REGRESSION COEFFICIENTS, IN CANADA BY REGIONS, 1950-1967

Region	Cattle				Sheep and Lambs
	All	Calves	Over 1 year old	Swine	
Canada.....	+0.0900	+0.0687	+0.0212	−1.5251	+1.1274
Atlantic.....	+0.1258	+0.0774	+0.0337	−1.6514	+1.3608
Quebec.....	+0.0012	+0.1004	−0.0991	−2.8643	+4.7973
Ontario.....	+0.4719	+0.3107	+0.1612	−1.9360	+1.6456
Prairies.....	+0.0933	+0.0879	−0.0325	−0.4886	+0.6173
British Columbia.....	+0.1287	+0.1358	−0.0071	−2.9079	+2.5006

deaths a year per 1,000 sheep and lambs on farms. Ontario and the Atlantic region followed Quebec, having annual death rates of 146 and 139, respectively. For Canada, the average rate was 128 per 1,000. British Columbia showed the lowest death rate, 93 per 1,000, and the Prairies the second lowest at 107 per 1,000.

Semi-Annual Death Rates

Death rates of both cattle and sheep in the six-month period, December through May (Table 2), exceeded those in the six-month period of June through November (Table 3), particularly the rates for sheep. Some causes for the difference are the losses of new born animals during the once-a-year calving and lambing season, and fewer cattle and sheep on farms on December 1 than on June 1. Swine, on the other hand, commonly farrow twice a year and therefore the semi-annual death rates did not show much difference.

During the period, December through May, Quebec had the highest death rates — 38 per 1,000 cattle (30 calves and 8 cattle of over 1 year old), 40 per 1,000 swine, and 162 per 1,000 sheep and lambs. In the period June through November, however, Ontario led all other regions by having the highest death rates per 1,000 — 20 cattle (13 calves and 7 cattle over 1 year old), 41 swine and 41 sheep and lambs.

Yearly Variations of Annual Death Rates

The death rates of cattle over one year old had the least annual variations in terms of standard deviations (Table 4). Calves under one year old showed considerably more variability in annual death rates than older cattle but much less than swine and sheep. Swine showed slightly less variability in annual death rates than sheep and lambs.

Quebec had the highest standard deviations of the annual death rates of all cattle, 5 per 1,000, and of sheep and lambs, 27 per 1,000. This shows that in about 11 out of the 17 years covered in the study, the annual death rates of all cattle in Quebec fluctuated between 47 and 57 per 1,000 and those of sheep and lambs fluctuated between 142 and 197 per 1,000. British Columbia led and Quebec closely followed in having the 2 highest standard deviations of annual death rates of swine, 18 and 16 per 1,000, respectively. The Prairies had the smallest annual variations in the death rates of both swine and sheep and lambs, and the Atlantic region had the lowest standard deviation of annual death rates of all cattle, 1.3 per 1,000.

Long Range Trends

During the 17 years covered in the analysis, swine showed a significant downward trend in the annual death rates while sheep and lambs showed a distinctly upward trend. This is true for all regions in Canada. On the other hand, the upward trends in the annual death rates of cattle were insignificant in all regions with the exception of Ontario (Table 5).

British Columbia and Quebec registered the greatest yearly decrease in the death rates of swine, about 2.9 per 1,000. The smallest annual decrease in the death rates of swine was registered in the Prairies, 0.6 per 1,000.

An upward trend in the annual death rates of sheep and lambs occurred in all regions. In Quebec, the yearly increase amounted to 4.8 per 1,000 during the 17 study years. In British Columbia, the yearly increase was 2.5 per 1,000. The lowest average yearly increase was registered in the Prairies, 0.6 per 1,000. For Canada as a whole, the yearly increase was 1.1 per 1,000.

The long range changes in the annual death rates of cattle over one year old fluctuated between the various regions in Canada. Annual death rates of calves showed a consistently upward trend in all regions, but the magnitude of the annual increment was small and statistically not very significant. However, the general trend of increase in the death rate of calves in Ontario and British Columbia deserves further examination.

SUMMARY AND CONCLUSIONS

The average annual death rate of all cattle in Canada was 45 per 1,000 during the 17 years from December 1950 to November 1967. Quebec had the highest annual death rate at 52 per 1,000 and the Atlantic Region had the lowest at 38 per 1,000.

The average annual death rate of swine in Canada was 74 per 1,000. Quebec had the highest annual death rate at 81 per 1,000 and British Columbia had the lowest at 62 per 1,000.

The average annual death rate of sheep and lambs in Canada was 128 per 1,000. Quebec had the highest annual death rate at 169 per 1,000 and British Columbia had the lowest rate at 93 per 1,000.

Death rates of cattle and sheep were higher in the December through May period than in the June

through November period. The death rates of swine were similar for the two periods.

The death rate of swine showed a significant downward trend and that of sheep and lambs an upward trend during the 17-year period. There was no significant trend for the death rate of cattle although there was a slight increase in Ontario.

Causes for the high death rates of sheep and lambs deserve study. It is possible that opportunities exist for reducing death losses of these animals by the control of pests and predators.

This study represents a beginning in the analysis of animal deaths in Canada. Collection and analysis of data on animal deaths should contribute to the formulation of policies and programs for reducing losses and increasing productivity of the nation's livestock economy.

NOTES AND ACKNOWLEDGEMENTS

- (1) For a more extensive and detailed analysis see W. Y. Yang, *A Statistical Analysis of the Death Rates of Farm Animals in Canada*, Pub. 69/10, Economics Branch, Canada Department of Agriculture, Ottawa.
- (2) See also W. Y. Yang, "Deaths of Farm Animals", *Canadian Farm Economics*, Vol. 3, No. 5, December 1968, pp. 16-19.
- (3) Acknowledgement is due to Messrs. G. B. C. Murray and P. L. Beerstecher, Livestock and Animal Products Section, Agriculture Division of the Dominion Bureau of Statistics for their co-operation and assistance and for making information available.
- (4) *Handbook of Agricultural Statistics*, Part VI, Livestock and Animal Products, 1871-1965, and the annual Livestock Surveys, Dominion Bureau of Statistics.
- (5) The death rate calculated by this method differs slightly from that reported in "Deaths of Farm Animals", *Canadian Farm Economics*, Vol. 3, No. 5, December 1968, pp. 16-19. The rate shown in that article was the sum of the semi-annual death rates.

THE PRAIRIE GRAIN ADVANCE PAYMENTS ACT, 1957-1969

J. W. Channon

In 1956 the grain crop in the Prairie Provinces totaled 1,203 million bushels. Only the 1952 crop of 1,338 million bushels had exceeded it in volume. This great volume of grain arrived at a time of depressed markets and resulted in the clogging of elevators and the backing up of grain onto the farms. By July 31, 1957, the prairie grain industry was in the unprecedented position of having a carryover of 734 million bushels of wheat alone, 323 million bushels of which was still on farms.

Under the Canadian Wheat Board system of marketing, producers do not receive any payment for their wheat, oats, or barley until the grain is delivered into the elevator system. With the elevators full there was no space to accommodate the 1957 deliveries. Consequently the producers were unable to obtain payment for their grain. The federal government accordingly passed legislation permitting the Wheat Board to advance part of the initial payment to those producers who were unable to deliver their grain because of the lack of space in the elevators. This was the Prairie Grain Advance Payments Act, proclaimed on November 25, 1957 and still on the statute books, although with increased entitlements. Only wheat (including durum), oats and barley are eligible grains.

The 1968 prairie grain crop of 1,227 million bushels was one of a series of 7 successively large crops that averaged 1,165 million bushels. Available markets were not large enough to move this volume and once again the commercial elevator system was unable to cope with all the grain that farmers wished to deliver. The grain remained in farmers' bins and in some cases piled outside on the ground.

However, there was a difference between 1956-57 and 1968. The cost of goods and services that farmers must buy for their farming operations and for their homes was much higher in 1968. The need for liquidity was greater. However, the cash advance system was well established and lent itself to quickly putting money into the hands of farmers. Accordingly, in October 1968, the federal government amended the Prairie Grain Advance Payments Act so that bona fide producers were eligible to receive double the amount of cash to which they had been entitled prior to the amendment. The current amounts payable are as follows: wheat \$1 a bushel, oats \$0.40 a bushel, and barley \$0.70 a bushel. Each holder of a Canadian Wheat Board permit book may receive an advance payment on the grain

he is entitled to deliver on his quota, up to the six-bushel per specified acre quota. The advance is limited to \$6,000 a permit book.

To obtain his advance payment, the farmer completes an application form available from his elevator agent. In his request for an advance the farmer certifies, among other things, that he has a stated quantity of threshed grain in storage on his farm. He promises to deliver his wheat, oats or barley as soon as the quota at his delivery point opens up, or as soon as other permission is given by the Wheat Board to make a delivery, and space is available at the elevator. He also undertakes to deliver enough of these grains until half of the initial payment for them is equal to the advance made to him.

Once the application is completed and an affidavit provided to the elevator agent certifying that the applicant indeed has in store on his farm the quantity of grain stated, and that he was the actual producer of that grain; and when the elevator agent has approved the application by signing the form, then the agent can advance the money to which the farmer is entitled. He usually does this in the form of a cash purchase ticket which, of course, is a negotiable document. The elevator agent then endorses the farmer's delivery permit book so that when the farmer eventually makes a delivery the elevator operator will be alerted to the fact that the permit-holder already has been paid part of his initial payment.

The November 1968 amendments to the Prairie Grain Advance Payments Act provided for the unit quotas to be included in the program, both for advance purposes and for reconciliation purposes, beginning with the 1968-69 crop year. Under the earlier legislation, unit quotas could not be used for advances (and deductions).

Because of legal and accounting problems, cash advances are not made to landlords and tenants separately. The legal problem arises as a result of provincial legislation. Property and civil rights, under the British North America Act, are matters of provincial concern and each of the Prairie Provinces has a statute known as the Crop Payments Act (1). This legislation provides in effect that where there is a landlord and tenant relationship and each is entitled to a share of the crop, each has an undivided interest in the grain and owns the grain produced on the land referred to in the lease. For example, the Manitoba Crop Payments Act, R.S.M.

1954, Chapter 55, sets forth that in all landlord-tenant relationships on a share basis, notwithstanding the Bills of Sale Act or any other act, the landlord shall have a right to and a special interest in the crops or the proceeds thereof. Inasmuch as the cash advance is part payment of the initial payment it constitutes proceeds for the grain, and under the provincial legislation the landlord has a special interest in that grain, in priority to the interest of the tenant. The Saskatchewan and Alberta statutes are to similar effect. Accordingly, before prepayment is possible all interested parties must agree on such action and be party to the required undertakings that are prerequisite to the cash being advanced.

Furthermore, the provincial legislation known as the Sale of Goods Act (2) sets out the conditions under which grain may be sold and delivered. The Prairie Grain Advance Payments Act is designed so as not to interfere with the normal sale and purchase of grain and so as not to complicate the documentation and accounting required when the ownership of grain changes hands.

Cash advances are not loans. In much the same way that a publishing house arranges to let an author have some money pending completion of his book, the Wheat Board arranges to let the grain producers have some money pending delivery of their grain. The publisher holds back the amount of the advance from the royalties due the author after the book is sold. Similarly, half of the initial payment is held back when a farmer who has received an advance payment delivers his wheat, oats or barley.

This hold-back goes to offset the portion of the initial payment already received. For income tax purposes, the cash advances are considered to be income at the time they are received. Were they loans, they would not be considered as income.

It should be noted that, although the current cash advance rates are greater than half the initial payments rates, only half of the payment is held back at the time of actual delivery. Accordingly, to fulfill his promise, the farmer has to deliver to the Wheat Board more than the quantity of grain on which his advance is based. For example, a farmer in the 14-cent freight zone who has taken the maximum advance of \$6,000 (6,000 bushels of wheat at \$1 a bushel) on a promise to deliver wheat would have to deliver at least 8,824 bushels to complete his agreement. This is based on No. 1 Northern. The lower the grade, the more grain the farmer has to deliver before his account is squared. Similarly, the higher the freight rate, the more the farmer has to deliver.

In the unlikely event that a producer fails to deliver his grain as agreed to, the Wheat Board would notify him that, in their opinion, he has had adequate opportunity to deliver his grain to the elevator. Ten days after this notification is sent out the farmer is deemed to be in default, if he has not in the meantime made delivery of enough grain to square his account.

A farmer in default becomes a debtor to the Canadian Wheat Board and indirectly to the Government of Canada, and interest at 6 per cent per annum is

TABLE 1—STATISTICAL SUMMARY OF PAYMENTS UNDER THE PRAIRIE GRAIN ADVANCE PAYMENTS ACT, 1957-58 TO 1968-69

Crop Year	Number Permit Books Issued	Advance Payment Applications		Total Amount Advanced	Average Amount Advanced	Advances Outstanding	
		Number	Percentage of Permit Books			Amount	Percentage of Amount Advanced
				dollars	dollars	dollars	
1957-58.....	226,316	50,412	22.3	35,203,467	698	3,324	0.009
1958-59.....	229,844	45,341	19.7	34,369,653	758	3,920	0.011
1959-60.....	225,294	50,047	22.2	38,492,505	769	4,683	0.012
1960-61.....	224,425	76,089	33.9	63,912,550	839	10,695	0.017
1961-62.....	223,674	22,342	10.0	16,656,713	745	9,725	0.058
1962-63.....	221,138	39,683	17.9	29,251,526	737	8,935	0.031
1963-64.....	214,879	63,427	29.5	62,136,418	980	20,829	0.034
1964-65.....	210,943	38,375	18.2	32,961,844	859	22,162	0.067
1965-66.....	205,186	43,509	21.2	40,600,386	933	37,943	0.094
1966-67.....	198,054	36,953	18.7	36,668,270	992	91,759	0.251
1967-68.....	192,057	45,811	23.9	47,280,533	1,032	1,703,349	3.857
1968-69.....	189,532	113,491*	—	151,852,319	1,338	41,488,104	27.321

* Following changes in the legislation in November 1968 more than one application was received from some permit book-holders. The number of producers applying for advance payments was estimated at about 85,000.

Source: Canadian Wheat Board.

chargeable on the amount outstanding. The defaulter is given a reasonable time to repay the money he has received, but if he persists in not making restitution, then court proceedings may be taken against him, either in the name of the Canadian Wheat Board or the Canadian Government. Such action is very rare. Virtually all farmers taking advantage of the cash advance program fulfill all their undertakings (Table 1). By July 31 each year until 1969, (the first year of the increased advance rates and the first year since the inception of the program that the delivery quota did not hit at least the six-bushel level before the end of the crop year) grain had been delivered against more than 99 per cent of the total amount advanced.

The number of applicants for cash advances has varied from year to year but until 1968-69 never exceeded a third of the total number of permit books issued by the Wheat Board. In 1968-69, about 85,000 out of a total of 189,532 permit book-holders applied for advance payments. Following the changes in the legislation more than one application was received from some producers.

The average cash advance has not been large; it exceeded \$1,000 in 1967-68 for the first time. This suggests that most of those who applied for cash advances in the 1957-68 period were operators of relatively small farms.

Because of marketing difficulties during the 1968-69 crop year not all producers had the opportunity to deliver enough grain to fulfill the agreement made with the Wheat Board when they received their advances. Thus, advances outstanding at July 31, 1969 totaled \$41.5 million. Nevertheless, no producer was legally in default and all were eligible for full advances when the new crop year commenced on August 1, 1969. By the beginning of September a further 22,000 advances had been made and a total of some \$57 million had been paid out on the 1969-70 program.

Under the terms of the Prairie Grain Advance Payments Act, the federal government guarantees repayment of cash advances and pays the interest on funds borrowed by the Wheat Board to make the advances. Prior to the 1968 amendments to the Act the interest cost to the government averaged about \$700,000 a year (Table 2). However, with the increase in the amount of advances, the cost of the interest to the government has substantially increased and probably will total between \$12 million and \$14 million for the current crop year.

SUMMARY

About a fifth of the holders of Canadian Wheat Board delivery permits took advantage of the provisions of the Prairie Grain Advance Payments Act

TABLE 2—COST TO THE FEDERAL GOVERNMENT FOR INTEREST CHARGES AND PAYMENTS DEFAULTED, PRAIRIE GRAIN ADVANCE PAYMENTS ACT, 1957-58 TO 1967-68

Crop Year	Total Cost
	dollars
1957-58	480,531
1958-59	524,407
1959-60	816,502
1960-61	1,471,719
1961-62	385,962
1962-63	489,513
1963-64	869,552
1964-65	540,360
1965-66	665,826
1966-67	540,180
1967-68	780,018
Total	7,564,570

Source: Canadian Wheat Board.

and obtained cash advances on unmarketed grain on their farms from 1957-58 to 1967-68. A substantial increase in the number of applicants and in the average size of the cash advance occurred in 1968-69 following changes in the legislation and with a relatively large quantity of unsold grain on farms. The average size of the cash advance made each year suggests that most of the applicants have been operators of relatively small farms. Experience with this program has shown that it is a quick and easy method of getting money to grain producers who are in need because they are unable to sell their grain.

REFERENCES

- (1) *Crop Payments Act*, Revised Statutes of Manitoba 1954, chapter 55.
Crop Payments Act, Revised Statutes of Saskatchewan 1965, chapter 228.
Crop Payments Act, Revised Statutes of Alberta 1955, chapter 69.
- (2) *Sale of Goods Act*, Revised Statutes of Manitoba 1954, chapter 233.
Sale of Goods Act, Revised Statutes of Saskatchewan 1965, chapter 388.
Sale of Goods Act, Revised Statutes of Alberta 1955, chapter 295.

ACKNOWLEDGEMENT

Acknowledgement is made of the assistance of Noel O'Connell, Department of Industry, Trade and Commerce, in providing information and reviewing this article.

POLICY AND PROGRAM DEVELOPMENTS

Ontario Wheat Producers' Marketing Order—Under the Agricultural Products Co-operative Marketing Act, the Ontario Wheat Producers' Marketing Board was authorized to collect levies of 20 cents per bushel of wheat marketed for a period ending June 30, 1969. An amendment to this Act extends the period to June 30, 1970. (July 2, 1969)

Alberta Crop Insurance—Amendments have been made extending the Alberta crop insurance program to new areas and adding rapeseed to the list of insurable crops in certain areas.

Crops now insured in Alberta are: wheat, oats, barley, peas and rapeseed. (July 15, 1969)

Sugar Beet Support Program—The 1969 sugar beet crop will be supported, through deficiency payments, at a national average price of \$15.98 per standard ton (250 pounds of sugar), delivered to the processing plant. This is the same level of support as in 1968. (July 22, 1969)

Ontario Bean Producers' Marketing Order—An Order in Council authorizes the Ontario Bean Producers' Marketing Board to market pea beans and yellow-eyed beans grown in Ontario in 1969. Beans are to be marketed on the basis of two pools, one for Canada No. 1 Eastern yellow-eyed beans and one for Canada No. 1 Eastern pea beans.

The Board received authority to pay an initial price of \$5.76 per hundredweight of beans delivered. If the

average wholesale price of the beans is less than the initial payment plus processing and marketing costs, the Federal Government will pay to the Board the difference between the two prices, subject to a maximum average wholesale price of \$7.11 per hundred-weight or a total of \$1 million.

The agreement will be in effect until December 31, 1970. (July 29, 1969)

Nova Scotia Hog Marketing Order—The Nova Scotia Hog Producers' Marketing Board is authorized to collect levies of 5 cents per hog marketed, for the period ending September 1, 1970. (August 13, 1969)

Apple Marketing in Quebec—The Co-operative Monteregienne in Quebec has been authorized to process apples grown in Quebec in 1969 and to market them in the form of apple juice, apple sauce, apple pulp and apple jelly. The Order in Council sets out standards for the apple products to be sold and specifies the maximum processing and marketing costs allowed.

The Co-operative Monteregienne may make to producers an initial payment of 40 cents a bushel for apples meeting the grade standards. If the average wholesale price of the products sold is less than the initial payment plus the processing and marketing costs, the Federal Government will pay the Co-operative, the difference between the two. This agreement came into force August 15, 1969 and expires December 31, 1970. (August 27, 1969)

PUBLICATIONS

ECONOMICS BRANCH PUBLICATIONS

A Statistical Analysis of Death Rates of Farm Animals in Canada, Yang, W.Y., Research Division, Economics Branch, Canada Department of Agriculture, Ottawa, July 1969, Pub. No. 69/10, pp. v + 62.

This publication provides statistical data and analyses on the death rates of cattle, swine and sheep in Canada over the 17-year period, 1950 to 1967.

Farm Real Estate Sales in the Prairie Provinces, 1963-1967, Ablasser, G., Economics Branch, Canada Department of Agriculture, Ottawa, March 1969, Pub. No. 69/6, pp. 214.

The overall purpose of this analysis is to provide basic information on various aspects of the farm land market in 14 areas of the Prairie Provinces. The study gives estimates of land values reflecting soil characteristics and examines the relationships of these values with a number of variables, such as the location and size of land tracts sold.

Organizational Characteristics of Grain Farms in the Prairie Provinces, 1956-1965, Joyce, T.F., Economics Branch, Canada Department of Agriculture, Regina, 1969, Pub. No. 69/9, pp. 46.

The publication contains data on the land use, receipts and expenses and capital investment of grain farms in the Prairie Provinces. The information was compiled from a series of studies entitled *Changes in Farm Organization*, conducted by the Economics Branch at its offices in Winnipeg, Saskatoon and Edmonton.

OTHER PUBLICATIONS

Not available from the Economics Branch

Performance of the Country Grain Elevator Industry in Southwestern Ontario, 1966-67, Sorflaten, Allan G., Farm Economics, Co-operatives and Statistics Branch, Ontario Department of Agriculture and Food, Parliament Buildings, Toronto, 1969, pp. 30.

This second report of the two-part study on Ontario's country grain elevator industry assesses the movement of grain through the country elevator marketing channels for one complete marketing year.

The objectives of the study were to determine the volume of grain handled and the patterns of delivery, shipment and storage; and to evaluate the adequacy of the available elevator facilities in handling variable quantities of grain at the times most suitable for delivery by producers.

Data for the study were obtained from a survey in the southwestern Ontario counties of Essex, Kent, Lambton, Middlesex and Elgin for the year July 1966 to June 1967.

The Beef Cattle Industry in British Columbia, British Columbia Department of Agriculture; Economics Branch, Canada Department of Agriculture; Economics and Statistics Branch, British Columbia Department of Industrial Development, Trade and Commerce, May 1969. pp. 129.

Information from a study on the supply and demand of beef cattle in British Columbia and a survey of production costs, returns and management practices of feeding beef cattle. Included are supply and demand prospects to 1975, market conditions and outlook.

UNITED NATIONS PUBLICATIONS

Available in Canada from the Queen's Printer, Ottawa
National Grain Policies, 1968, Food and Agriculture

Organization of the United Nations, Rome, 1969. pp. iv + 92.

This is the tenth annual bulletin on national policies and measures affecting grains. The present issue covers policies in force during the 1967/68 season in 39 countries.

The World Dairy Economy in Figures, Food and Agriculture Organization of the United Nations, Rome, 1969. pp. xi + 119.

A country-by-country tabulation of statistical information on the production, trade, prices and consumption of milk and milk products. Data from 39 countries for the years 1948 to 1967 are included.

Review of the Agricultural Situation in Europe at the End of 1968, Volume II, Economic Commission for Europe, Food and Agriculture Organization of the United Nations, New York, 1969. pp. 183 to 321.

This report contains information on dairy products and eggs in Europe in 1967 and 1968.

Planning for Action in Agricultural Development, Yang, W.Y., Agricultural Services Bulletin No. 2, Food and Agriculture Organization of the United Nations, Rome, 1969.

The purpose of this bulletin is to call the attention of leaders in developing countries to the feasibility and potential of increasing agricultural productivity. Emphasis is placed on the need for realistic planning and effective action at appropriate levels.

Examples of the experiences of a few developing countries in increasing agricultural production are discussed.

VOLUME 4 NUMBER 5

DECEMBER 1969

CANADIAN FARM ECONOMICS



- The Common Agricultural Policy of the EEC and its
Implications for Canada
J. S. Lohar and M. N. Gifford 1
- The Canadian Apple Industry *J. R. Burns* 8
- Costs and Returns on Wheat Farms, Central Sas-
katchewan *E. A. K. Grahm* 18
- Policy and Administration of Public Lands in the
Atlantic Region with Particular Reference to Agri-
culture *G. C. Retson* 24
- Policy and Program Developments 7
- Publications 28

HON. H. A. OLSON, MINISTER—S. B. WILLIAMS, DEPUTY MINISTER

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CANADIAN FARM ECONOMICS

THE COMMON AGRICULTURAL POLICY OF THE EEC AND ITS IMPLICATIONS FOR CANADA

J. S. Lohoar and M. N. Gifford

In recent years the development of the Common Agricultural Policy (CAP) of the European Economic Community (EEC) has had a significant impact on world trade in temperate agricultural products as well as upon the farm sectors of the six countries which currently comprise the EEC (France, West Germany, the Netherlands, Italy, Belgium and Luxembourg).

Although common policies now exist for most agricultural commodities, changes in these policies continue to exert a major influence in world markets and in turn on Canada's trade in agricultural products. In this article, a brief outline of the development of the CAP together with a description of how the policy operates is given first.

This is followed by a review of the impact of the CAP both within the Community and in relation to its effect on Canada's agricultural exports. Possible future developments in the CAP are then considered. (1)

THE COMMON AGRICULTURAL POLICY (CAP)

The "common market" which now exists for most agricultural commodities in the EEC had its origins in the Stressa Conference of 1958. The conference had a mandate under Article 43 of the Treaty of Rome (the EEC constitutional authority) to make recommendations for a future common agricultural policy which would operate in all member countries. The conference established broad policy objectives which have been translated into common price and market regulations.

The first regulations for grains, pork, eggs, poultry, fruits and vegetables, and wine were approved in 1962 after lengthy negotiations between the six member countries. Between 1962 and 1967, further progress was made in eliminating national subsidies and import quotas and establishing common standards of quality within the Community. In July 1967, unified grain prices were introduced which enabled a true common market to be established for grains, pork, poultry and eggs. This was followed by regula-

tions for oilseeds, olive oil, rice, sugar and horticultural products.

During 1968, the EEC adopted regulations for dairy products, beef and veal. These developments mean that common price and market arrangements are now operating for nearly all farm products (more than 90 per cent of agricultural production) in the Community. Regulations still have to be finalized for tobacco, mutton and lamb, hops and potatoes.

THE OPERATION OF THE CAP

The CAP is based upon three main principles:

- (a) free movement of farm products between the six member countries, so that these products may be bought and sold as freely throughout the area of the EEC as they have in the past within each country's domestic market;
- (b) the same level of agricultural prices in the six member countries, with support measures being financed jointly by the Community;
- (c) trade in agricultural products with third countries is governed by a common trade policy.

Thus, when the common market organization for a product is established, trade between member states should take place as in any domestic market. In actual fact, certain regulatory matters such as plant and animal health requirements, taxation and other matters affecting intra-EEC trade have yet to be resolved.

Each year the Council of Ministers sets a "target" price for each of the products covered by the CAP. In order to achieve the target prices a complex system of "variable levies" (against third country imports), government purchases and export subsidies is utilized for most products. The variable levies are equal to the difference between the lowest represen-

tative world price and the "threshold" price (the target price increased by a standard amount intended to afford protection to domestic production). This system of variable levies supersedes tariffs in most cases. Government purchases take place at an "intervention" price (in effect, the support price) somewhat lower than the target price. The internal price structure is further stabilized by the availability of an export rebate which permits higher-priced EEC products to be moved into world markets. The export subsidy was originally the equivalent of the import levy but it now tends to be set by individual destination and at whatever level is needed to meet competition.

In December 1968, the EEC Commission submitted its recommendations on the 1969-70 target

prices to the Council of Ministers. The difficulty for six sovereign states to arrive at common prices for agriculture resulted in the announcement being delayed until April 1969 for field crop prices. In the case of dairy products and beef, difficulties in arriving at agreed prices have resulted in the decision still being postponed. The Council decision in April was essentially in favor of maintaining the status quo until time permits a thorough review of price relationships, together with other policies to influence the production pattern. The only changes were small increases in the prices of barley and corn and a small reduction in the quantity of sugar enjoying the full support price. The target price for milk remains at the 1968-69 level although approval has recently been given to a scheme which will provide a slaughter subsidy of \$200 per head for dairy cows which are

TABLE 1—AGRICULTURAL PRICES IN THE EEC, SELECTED COMMODITIES, 1968-69 AND 1969-70

	1968-69		1969-70	
	U.S. dollars per metric ton	Canadian dollars	U.S. dollars per metric ton	Canadian dollars
Durum wheat				
Target price.....	125.00		125.00	3.67 per bushel
Support price.....	117.50		117.50	3.45 per bushel
Soft wheat				
Target price.....	106.25		106.25	3.12 per bushel
Support price.....	98.75		98.75	2.90 per bushel
Barley				
Target price.....	94.44		94.44	2.24 per bushel
Support price.....	87.97		88.48	2.08 per bushel
Corn				
Target price.....	94.94		95.94	2.63 per bushel
Rye				
Target price.....	97.50		97.50	2.67 per bushel
Support price.....	91.00		91.00	2.50 per bushel
Oilseeds				
Target price.....	202.50		202.50	9.92 per 100 pounds
Support price.....	196.50		196.50	9.63 per 100 pounds
Milk				
Target price.....	103.00	5.04 per hundredweight	a	a
Butter				
Intervention price.....	1,735.00	85.00 per hundredweight	a	a
Skim milk powder				
Intervention price.....	412.50	20.15 per hundredweight	a	a
Beef				
Guide price for cattle.....	680.00	32.10 per hundredweight	a	a
Guide price for calves.....	915.00	45.20 per hundredweight	a	a

* Prices for 1969-70 have not yet been announced. Price levels of the preceding year remain in effect.

Source: *Agriculture Abroad*, February 1969, p. 26, Canada Department of Agriculture.

TABLE 2—PRODUCTION OF SELECTED AGRICULTURAL PRODUCTS IN THE EEC

Product	1960-64	1967	1968
thousand metric tons			
Grain			
Wheat.....	26,163	31,332	32,205
Rye.....	4,186	3,928	3,928
Barley.....	10,812	16,019	15,305
Oats.....	6,236	6,867	6,455
Corn.....	6,396	8,198	9,452
Total grain.....	53,793	66,344	67,345
Potatoes.....	46,970	42,555	39,704
Sugar beets.....	39,851	48,654	51,090
Beef and veal.....	3,838	4,042	4,212
Pork.....	4,455	4,640	4,953
Poultry meat.....	990	1,375	1,412
Cows' milk.....	67,524	72,410	74,158
Rapeseed.....	258	570	635

Source: *Production Vegetale*, No. 9, September 1969, EEC Statistical Office.

either slaughtered or whose production is not marketed.

IMPACT OF THE CAP WITHIN THE EEC

The major problem of the CAP is that to achieve a common policy it has been necessary, mainly for political reasons, to set the target prices in the Community at extremely high levels (Table 1). Farm prices in France in particular have increased and this gain has been viewed as payment for the concessions France has had to give, mainly to West Germany, in the industrial sector.

The result of the favorable producer prices has been an expansion of agricultural production (Table 2). The increased output has not been matched by similar increases in domestic consumption since the higher producer prices have been passed on to the consumer in the form of higher retail prices. The combined effect of expanded production and the limited increase in domestic consumption has been a general increase in agricultural self-sufficiency within the Community and the emergence of burden-

some surpluses for some products, particularly dairy products, soft wheat and sugar. (At the end of 1968, government stocks of butter in the EEC were estimated at 300,000 metric tons—equal to one-fifth of production that year. Stocks of skim milk powder were estimated at about 350,000 metric tons, at the close of the 1968-69 dairy season—March 31, 1969).

The expanded production and associated surpluses have been reflected in the growing cost of the CAP. The cost of implementing the price guarantees and the expenditures on export subsidies have far outstripped the revenue accruing from levies and customs duties on third country imports—originally envisaged as a means of self-financing. As a result, the direct cost of the CAP to national governments has increased substantially. It is estimated that the total cost of implementing the CAP increased from \$1.8 billion in 1967-68 to \$2.4 billion in 1968-69 and will exceed \$3.0 billion in 1969-70 (Table 3).

Under the existing financial arrangement (which lapses at the end of 1969), member countries finance the CAP by contributing 90 per cent of their receipts from levies and custom duties on agricultural imports from third countries to the common fund, the

TABLE 3—EUROPEAN AGRICULTURAL GUIDANCE AND GUARANTEE FUND EXPENDITURES, 1962-63 TO 1969-70

	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70 (estimated)
millions of U.S. dollars								
Guarantees....	29	51	163	240	370	1,313	2,012	2,770
Guidance.....	9	17	54	80	124	285	285	285
Total.....	38	68	217	320	494	1,806*	2,437*	3,124*

* Totals include special temporary payments made in 1967-68, 1968-69 and 1969-70 to German, Italian and Luxembourg grain producers.

Source: *Common Market Farm Report*, No. 38, December 1968, Washington, D.C.

TABLE 4—EUROPEAN AGRICULTURAL FUND: MEMBER STATES' CONTRIBUTIONS AND REPAYMENTS UP TO DECEMBER 31, 1968^a

	Contributions		Repayments	
	Guarantee	Guidance	Guarantee	Guidance
	millions of U.S. dollars			
Belgium.....	156	23	95	15
France.....	436	82	875	44
Germany.....	538	87	168	56
Italy.....	413	64	306	150
Luxembourg.....	5	1	1	3
Netherlands.....	200	27	303	16
Total.....	1,748	284	1,748	284

^a Excludes special temporary payments made in 1967-68 totaling \$208 million to German, Italian and Luxembourg grain producers for losses caused by diminishing grain prices.

Source: *Common Market Farm Report*, No. 38, December 1968, Washington, D.C.

European Agricultural Guidance and Guarantee Fund. The remaining revenue required for market support and export subsidies (the "Guarantee" section) and expenditures on structural improvements of production and marketing (the "Guidance" section) must be contributed by member countries according to a fixed scale. There is a growing reluctance on the part of national governments, particularly Germany, to continue to underwrite the increasing cost of the Common Agricultural Policy in its present form (Table 4). A major decision to be taken by the EEC before the end of 1969 is how the CAP is to be financed from 1970 onwards.

EEC Agricultural Trade

A review of EEC trade for 1968 shows the extent to which the establishment of a common market continues to foster the trade of member countries in agricultural products even more than other sectors. Intra-EEC trade in the agricultural sector (food, beverages and tobacco) increased 21 per cent over 1967 whereas total intra-EEC trade rose by only 17 per cent. In trade with third countries, agricultural imports fell by 3 per cent while exports rose by 6 per cent, reflecting rising production and surpluses within the EEC.

Since the beginning of the Common Market, agricultural trade among member countries has quadrupled from \$908 million to \$3.7 billion as against an increase of two and a half times for total intra-EEC trade. At the same time, agricultural imports from third countries rose from \$4 billion in 1958 to a peak of \$6.5 billion in 1966 but have since fallen to \$6 billion in 1968. Agricultural exports to third countries rose from \$1.5 billion to \$2.5 billion during the decade. Thus, the deficit in

agricultural trade with outside countries remains substantial, from \$2.5 billion in 1958 to a peak of over \$4 billion in 1966 but since tapering off to \$3.5 billion in 1968 (2).

SPECIFIC IMPLICATIONS OF THE CAP FOR CANADA

The impact of the CAP on Canadian agricultural exports arises both directly and indirectly. The high internal support prices tend to lead to increased production in the EEC and thus reduce markets for Canadian exports within the Community. On the other hand, the disposal of EEC surplus production through export subsidies is resulting in depressed prices on world markets, thus affecting Canada's trade with third markets.

These two impacts are considered in turn:

Trade with the EEC

The period following the creation of the EEC was characterized by rapid economic growth and a corresponding increase in agricultural import demand. Moreover, the first regulations under the CAP did not come into being until 1962 and it was not until 1967 that the first common price levels were introduced. Against this background, Canadian agricultural exports to the EEC were well maintained and some commodities, especially feedgrains and oilseeds, experienced a strong surge in demand (Table 5). In the past year or so, however, the relatively slower rate of economic growth within the EEC together with the farm sector's technological and production response to the high support levels of the CAP have combined to reduce the import requirements of the Community. In 1968, Canadian

TABLE 5—VALUE OF CANADA'S MAJOR AGRICULTURAL EXPORTS TO THE EEC, 1958-61 TO 1968

	1958-61 average	1962-65 average	1966	1967	1968
millions of Canadian dollars					
All agricultural commodities.....	163	190	221	206	156
Wheat.....	122	125	118	118	106
Oats.....	1.1	8.1	7.3	—	—
Barley.....	2.2	3.5	14.2	23.5	9.3
Rye.....	1.7	4.3	3.6	2.4	0.2
Total feedgrains.....	5.0	15.9	25.1	25.9	9.5
Flaxseed.....	12.2	11.5	23.8	14.1	9.2
Mustard seed.....	1.0	1.1	1.9	2.2	3.2
Rapeseed.....	7.9	7.2	14.2	11.9	1.2
Soybeans.....	—	0.2	0.4	0.5	0.1
Sunflower seed.....	—	0.2	0.3	0.1	—
Total oilseeds.....	21.1	20.2	40.6	28.8	13.7
Hides, skins and furs.....	6.1	8.4	15.6	8.7	9.7
Tobacco.....	1.1	2.7	1.6	0.8	0.5
Milk powder.....	1.5	2.4	2.5	4.9	1.9

Source: *Canada, Trade in Agricultural Products*, August 1969, Economics Branch, Canada Department of Agriculture.

agricultural exports to the EEC fell sharply, amounting to only \$156 million compared with the 1962-67 annual average of \$198 million. This decline was reflected in all three major commodity categories—wheat, feedgrains and oilseeds—and represented the lowest level of Canadian agricultural exports to the EEC since 1960.

Wheat—Canadian wheat exports to the EEC have fluctuated from a low of \$97 million in 1959 to a high of \$178 million in 1961 and therefore it is difficult to determine whether or not the 1968 level of \$106 million reflects a downward long-term trend. Durum wheat has accounted for about a third of our total wheat exports to the EEC while, in the past, the quality advantage of Canada's hard spring wheat has been a major factor in maintaining wheat sales to the Community, even in the face of levies and increased domestic production. However, future prospects are not encouraging in view of the inevitable technological progress resulting in increased use of soft wheat in bread-making and the growing surplus of soft wheat within the EEC.

Feedgrains—Canadian exports of feedgrains to the EEC, primarily barley, depend largely on supply conditions within the EEC. The increase in EEC grain production in general and the large increase in barley production in particular, together with the prospect that this is likely to continue, will make it difficult to recover the \$14 million decline in Canadian exports of barley experienced in 1968. Total grain production within the EEC was more than 22 per cent higher in 1968 compared with the 1960-64

average. Barley production increased by nearly 50 per cent during the same period (Table 2).

Oilseeds—Although there is no levy or tariff on oilseed imports into the EEC, the high support price (\$9.63 per hundred pounds in 1969-70) combined with an offset subsidy to the processing industry to encourage domestic oilseed utilization have resulted in EEC rapeseed production more than doubling since 1963. Reflecting, in part, these factors Canadian rapeseed exports to the EEC fell from a high of \$14.2 million in 1966 to \$1.2 million in 1968. Moreover, in the last few years Canadian oilseed exports have also been adversely affected by the competition of supplies of oil and oilseeds from Eastern Europe. In 1968, both rapeseed and flaxseed exports to the EEC were down sharply with only mustard seed showing an increase over the preceding year. Canadian oilseed exports to the EEC in 1968 were the lowest since 1964.

Tobacco—Tobacco still remains outside the CAP and although Canada is a relatively minor, albeit traditional, supplier to the Community (exports of \$0.5 million in 1968 compared with United States exports of tobacco to the EEC of \$139 million) the adoption of a Common Tobacco Policy could adversely affect Canada. Of prime concern are future prospects for our related sales to the United Kingdom which account for more than 90 per cent (\$50 million in 1968) of Canada's tobacco exports. These sales could be seriously affected by increased competition in the U.K. market, by market diversion of U.S. and other exports, which could result from any restriction

of market access into the EEC, and/or any change in access into the U.K. itself in the event of U.K. accession to the EEC.

At the present time, only 30 to 40 per cent of total tobacco consumption in the EEC is produced domestically—with the remainder being mainly imported from the United States, Greece, Rhodesia, Brazil, Bulgaria, Argentina and Turkey. Canada, together with other exporters, has made representations to the EEC indicating its concern over the establishment of a Common Tobacco Policy which would likely include production incentives to member and associated member countries (for example, Greece and Turkey) through high support prices, offset subsidies to manufacturers, and export rebates.

Exports to Third Markets

Examples of subsidized exports from the EEC affecting Canada's position in third markets include:

Wheat Exports—The system of export subsidies which is provided for under the CAP has been one factor leading to the present price instability in world wheat markets. EEC export subsidies are designed to make EEC products competitive anywhere in the world because the restitution payments vary according to geographic destination. Unsubsidized Canadian wheat exports have therefore had to face severe price competition in many markets.

Barley Exports to Japan—During the first half of 1969, Canada has been virtually excluded from the Japanese market because of the export subsidies on French barley. Up to July 1, 1969, Canada exported \$44,000 worth of barley to Japan, compared with \$12,465,000 in the first 6 months of the preceding year. In March 1969, French export subsidies amounted to \$1.23 per bushel compared with the offer for No. 1 Canadian feed barley f.o.b. Pacific ports of \$1.02 per bushel. Thus, the export subsidy on French barley exceeded the total Canadian selling price. Before 1969, Japan represented the largest single export market for Canadian barley. (Competitive Canadian pricing in the latter half of 1969 has offset to a large extent the disastrous first half).

Cheddar Cheese to the U.K.—As a result of heavily subsidized EEC cheese exports disrupting the U.K. market, Canada has been forced to join an exporters' agreement to limit exports to the U.K.

Apples to the U.K.—Increasing production of apples within the EEC, especially in France and Italy, is

resulting in stiff competition in the U.K. market and a substantial decline in Canadian exports to the U.K. Apple exports to the U.K. have declined every year since 1965, from \$5.3 million to \$3.0 million in 1968. The recent devaluation of the French franc has intensified the competition from French apples in the U.K. market as no measures have been introduced to nullify the impact of devaluation on fresh fruits and vegetables.

FUTURE PROSPECTS

Although the CAP is scheduled to be finalized by the end of 1970, it is certain that this will not mark the end of its evolution. In fact as the various components of the CAP have been settled, it appears that this progress has tended to introduce elements of instability into the system rather than the contrary. This instability is characterized by the growing surpluses of several commodities in the EEC. It is therefore probable that major adjustments in the existing CAP will be necessary in the future. The changes in the exchange rates of both the French franc and the German mark in rapid succession may result in these modifications being introduced sooner rather than later.

What direction will these changes in policy take? Although it is difficult to forecast with any certainty how the CAP is likely to evolve, three possible developments can be envisaged. First, it may prove impossible to maintain a common agricultural policy in the face of the disrupting effects introduced by the recent devaluation of the franc and the revaluation of the mark. Although temporary measures have been introduced to nullify the impact of the changed exchange rates on the agricultural sector, it may prove difficult to discontinue these measures and thus there could be permanent fragmentation of the CAP into a number of different national policies.

Alternatively, the new exchange parities could facilitate the reduction of the EEC target prices. This could result in an accelerated introduction of the Mansholt "Agriculture 1980" Plan with its emphasis on structural reform (3).

The third possible avenue which can be envisaged would be some modification in the present CAP to accommodate the countries which are at present seeking membership in the EEC. In particular, the entry of the U.K. into the Community could be expected to have important implications for the future of the CAP as well as a considerable impact on Canada's trade in agricultural commodities with the U.K.

Regardless of which direction the CAP takes in the future, it is probable that the protective nature of the present policy with its apparently inherent tendency to increased self-sufficiency within the EEC will not be drastically changed. In view of this, it is to be hoped that the full impact of such policies on countries exporting temperate agricultural commodities, such as Canada, can be assisted to some degree by effective international co-operation, for example, the current work program of the Agricultural Committee of the GATT. In the absence of increased international co-operation, there is considerable danger that world markets for many agricultural commodities will be increasingly disrupted.

NOTES AND REFERENCES

- (1) Most of the material in this article is based upon despatches from the Canadian Mission to the European Communities, Brussels. The authors therefore wish to especially acknowledge the assistance of R. A. Gherson and V. F. Wightman of the Canadian Mission, in the preparation of this article as well as the helpful comments received from Dr. G. A. Hiscocks and Dr. G. J. Dobson, Economics Branch, Canada Department of Agriculture.
- (2) "European Economic Community", *Agriculture Abroad*, Canada Department of Agriculture, June 1969.
- (3) For details on the Mansholt proposals for the long-term structural reform of the EEC farm sector, see "Agriculture 1980", European Economic Community Information Service, Washington, D.C., May 1969; and "European Economic Community", *Agriculture Abroad*, Canada Department of Agriculture, February 1969.

POLICY AND PROGRAM DEVELOPMENTS

Wool Price Stabilization Order—The Agricultural Stabilization Board is authorized to support the price of all wool (except reject grades) at 150.8 per cent of the base price on a minimum of 100 pounds of wool per producer delivered for marketing during the period April 1, 1969, to March 31, 1970. The Stabilization Board established the base price as 39.78 cents per pound of wool, for representative grades of wool, f.o.b. Toronto. (September 17, 1969)

Sugar Beet Stabilization Order—The Agricultural Stabilization Board is authorized to make interim payments to sugar beet producers in accordance with the schedule specified by Order in Council, P.C. 1969-1780.

The support price for sugar beets from September 1, 1969 to August 31, 1970 is \$15.98 per standard ton, approximately 119 per cent of the base price. (September 17, 1969)

Farm Syndicate Loans to Indians—By recent amendments to the Farm Syndicates Act, loans for the co-operative purchase and use of farm machinery, buildings and installed equipment are now available to syndicates of three or more Indians farming on reserves. These farm syndicate loans are made through the Farm Credit Corporation. (October 2, 1969)

Feed Freight Assistance Rates—An announcement was made that the Feed Freight Assistance Program rates will be reduced effective November 1, 1969. The reason for the rate reduction is to cut down on the expenditures of the Canadian Livestock Feed Board.

The budget for this program is \$21.5 million for this fiscal year and, at current assistance rates, projected expenditures would amount to \$24.5 million. To provide for this, the Government has authorized a \$1.0 million increase in the budget of the Board for this year, and the remainder will be met by adjustments in assistance rates. (October 16, 1969)

Ontario Onion Producers' Marketing Order—Because of substantial changes in the functions of the Ontario Onion Producers' Marketing Board, the previous Ontario Onion Producers' Marketing Order has been revoked and a new Marketing Order has been made.

The Marketing Order authorizes the Ontario Onion Producers' Marketing Board to regulate the marketing of onions in interprovincial and export trade and for such purposes the Board may exercise all or any powers like the powers exercisable by the Board in relation to marketing onions locally. (October 29, 1969)

Final Payments to Ontario Bean Producers—An Order in Council authorizes the Ontario Bean Producers' Marketing Board to make final payments of 80 cents per hundredweight of pea beans and 58 cents per hundredweight of yellow-eye beans, produced in 1968, delivered to the Board for marketing. These final payments are possible because proceeds from the sales of all pea beans and yellow-eye beans exceeded the initial payment to producers plus carrying and processing costs. (November 5, 1969)

THE CANADIAN APPLE INDUSTRY

J. R. Burns

World production of table apples shows an increasing trend. Production in some countries has been increasing quite rapidly and in others has been decreasing (Table 1). Assessments of the world demand for apples during the next few years indicate surplus supplies (1).

Canada is the Commonwealth's largest producer of table apples outside of the United Kingdom and ranks about ninth among Northern Hemisphere producers. Canadian apple production has been increasing more rapidly than that of the United States, the world's largest producer. In the ten-year

TABLE 1—APPLES: PRODUCTION OF DESSERT AND COOKING VARIETIES IN SPECIFIED COUNTRIES, AVERAGE 1960-64, ANNUAL 1966 TO 1968^a

Continent and Country	Average 1960-64	1966	1967	1968 ^b
thousand bushels ^c				
North America				
Canada ^d	18,924	21,042	24,491	19,959
Mexico	3,562	5,787	5,833	5,893
United States ^d	125,311	126,490	119,672	119,224
Total	147,797	153,319	149,996	145,076
South America				
Argentina	20,216	23,676	21,568	20,953
Chile ^d	2,503	2,388	2,985	3,031
Europe				
EEC				
Belgium-Luxembourg	7,332	9,875	13,779	8,405
France ^e	39,230	63,290	65,357	68,343
Greece	74,562	67,666	104,425	67,351
Germany, West	100,144	105,113	88,721	90,710
Italy	15,111	15,754	22,445	16,534
Netherlands				
Total	236,379	261,698	294,727	251,343
Austria ^e	12,843	10,426	11,299	9,967
Denmark ^d	3,839	3,527	3,909	3,789
Greece	5,971	7,614	8,196	8,818
Norway	2,840	1,863	2,260	2,995
Spain ^e	13,330	16,617	13,829	19,662
Sweden ^d	1,818	2,149	1,938	1,984
Switzerland ^e	8,895	4,143	4,363	2,465
United Kingdom ^e	23,819	20,291	13,081	15,633
Yugoslavia	10,261	9,829	13,825	11,023
Total	83,616	76,459	72,700	76,336
Total Europe	319,995	338,157	367,427	327,679
Africa				
South Africa, Republic of	5,567	8,417	9,583	10,400
Asia				
Japan	46,632	48,639	51,670	51,900
Lebanon	3,573	5,052	8,543	7,808
Turkey	13,562	20,209	29,395	22,965
Oceania				
Australia	15,600	16,991	16,875	18,465
New Zealand	3,958	4,612	5,126	4,595
Total specified countries	579,403	621,460	663,168	612,872

^a May include some cider varieties in countries not reporting separately. Years shown refer to years of harvest in Northern Hemisphere. Harvests of Northern Hemisphere countries are combined with those of the Southern Hemisphere which immediately follow: thus, the crop harvested in the Northern Hemisphere in 1966 is combined with preliminary forecasts for the Southern Hemisphere harvests which began late in 1966 and ended early in 1967.

^b Preliminary.

^c Basic production data reported in units other than bushels converted to 48 pound equivalents.

^d Commercial crop.

^e Excludes cider apples reported separately.

Source: Foreign Agricultural Service, United States Department of Agriculture.

period, 1956-66, Canadian production increased 2.4 per cent per year while that of the United States increased 1.6 per cent. In the past both Canada and the United States exported considerable portions of their crops to the United Kingdom and Europe but this movement has slowed significantly. Of importance to the North American situation is the production of apples in Mexico. Although proportionately small, compared with Canada and the United States, production in that country has risen from the 1960-64 average of 3.5 million bushels to an estimated 7.8 million bushels for 1969. This growth rate exceeds that for Canada but to date it has not affected the supply situation to an appreciable extent.

APPLE PRODUCTION IN CANADA

Although apples are grown in all provinces in Canada, only in British Columbia, Ontario, Quebec, Nova Scotia, and to a small extent in New Brunswick, are they of significant commercial importance. In 1966, apples were grown for commercial purposes on 9,797 farms in Canada, a decline of 43 per cent from 1961. In 1966, apple trees occupied 97,623 acres in Canada, 73 per cent of that occupied in 1941 (Table 2). The average acreage of apples per farm growing apples in 1966 was about 10 acres. In Nova Scotia the average area was 14 acres, in Quebec 11 acres, in Ontario 9.7 acres, and in British Columbia 8.4 acres.

TABLE 2—APPLES: NUMBER OF ACRES, 1941, 1951, 1966; NUMBER OF FARMS REPORTING, 1961 AND 1966, BY PROVINCES, CANADA

	1941	1951	1961	1966	
	acres	acres	number of farms	number of farms	acres
Canada.....	132,993	118,403	17,282	9,797	97,623
Newfoundland.....	—	5	12	4	3
Prince Edward Island.....	163	259	83	39	152
Nova Scotia.....	37,030	19,847	1,337	903	12,902
New Brunswick.....	2,377	3,059	522	279	2,237
Quebec.....	21,822	29,460	4,732	2,240	24,707
Ontario.....	46,755	41,407	6,365	3,555	34,597
Manitoba.....	309	105	157	47	195
Saskatchewan.....	128	91	129	32	168
Alberta.....	118	76	84	22	89
British Columbia.....	24,291	24,094	3,861	2,676	22,573

Source: *Census of Canada, Agriculture*, Dominion Bureau of Statistics

TABLE 3—DISTRIBUTION OF APPLE TREES IN CANADA, 1941, 1951, 1961 AND 1966

	1941 ^a	1951 ^b	1961 ^b	1966
	thousand trees			
Nova Scotia.....	1,817	898	585	620 ^a
New Brunswick.....	147	164	117	122
Quebec.....	1,280	1,598	1,252	1,160 ^d
Ontario.....	1,887	1,509	1,371	1,175 ^e
British Columbia.....	1,366	1,227	1,418	1,540 ^f
Canada.....	6,497	5,396	4,743	4,617

^a All trees: taken from *Census of Canada, Agriculture*, Dominion Bureau of Statistics.

^b 25 or more trees: taken from *Census of Canada, Agriculture*, Dominion Bureau of Statistics.

^c 1966 Annapolis Valley Apple Tree Survey, Dominion Bureau of Statistics and Nova Scotia Department of Agriculture and Marketing.

^d Estimates of the Quebec Department of Agriculture and Colonization.

^e 1966 Fruit Tree Census, Ontario Department of Agriculture and Food.

^f British Columbia Tree Fruits Limited (Okanagan and Kootenay).

Tree Numbers

The average life of a commercial apple orchard is between 30 and 40 years. In the colder areas where trees develop more slowly some orchards may last longer. (On the other hand, sudden low temperatures in these areas may result in a high casualty rate.) In the areas where trees develop more rapidly, peak production may have been passed at 30 years. The time required for a tree to start producing depends on the rootstock, the variety and vigor of the tree, but usually about 6 to 8 years is required, and another 8 to 10 years before the orchard produces an appreciable tonnage. Thus, about a quarter of the life of the tree is required to bring it into commercial production. For continuous production about one-quarter of the trees should be under 10 years of age. In recent years, dwarfing rootstocks have been used fairly extensively. These trees begin production somewhat earlier than the standard tree. Census data on tree numbers, therefore, are not completely reliable indicators of production trends.

The Canadian apple tree population declined from 6.5 million in 1941 to 4.6 million in 1966 (Table 3). The decline was continuous in all commercial apple-producing provinces except Nova Scotia and British Columbia. In these two provinces, tree numbers have been increasing in recent years.

British Columbia Tree Fruits Ltd. reports that more than 3,700 acres of apples have been planted in British Columbia since 1964-65, following a frost that killed a large number of trees. These plantings are thought to total more than 390,000 trees, of which 75 per cent are on standard or semi-standard

rootstocks. It is difficult to compare the potential of these plantings with those of earlier years because of changes in varieties and in rootstocks. A portion of the recent plantings of McIntosh are intended to be budded or grafted to other varieties but the extent is unknown. In British Columbia, the usual planting per acre is 50 standard trees, 100 semi-standard, 200 semi-dwarf or 300 dwarf trees.

In Ontario the latest available data (1966) indicate a total of 1.2 million trees of which, 748,792 trees were on standard rootstocks and 426,636 on size-controlling rootstocks. The decline in standard plantings has been relatively slow but plantings of size-controlling stock have shown sharp increases. The number of standard rootstocks in 1966 was 90 per cent of that in 1961, and the number of size-controlled trees was 156 per cent of 1961.

A survey by the Quebec Department of Agriculture in 1963 indicated fewer plantings than in 1961 and a further decline in the number of trees of about 9 per cent. There were reported plans for further plantings which would have increased the tree population to 1.265 million by 1966, however this target was not reached. According to recent estimates the tree population is only 1.175 million. This slow rate of replacement planting is raising the average age of the orchards in Quebec.

In Nova Scotia some 84,000 trees have been planted since 1966. In the ten-year period 1954-64 only 103,000 trees were planted. The rate of removal of trees is increasing as growers become more aware and better acquainted with dwarfing rootstocks. Standard trees however are still popular making up about 25 per cent of plantings.

TABLE 4—PERCENTAGE OF APPLE TREES IN BEARING, CANADA, 1941, 1951, 1961 AND 1966

	1941 ^a	1951 ^b	1961 ^b	1966
	per cent			
Nova Scotia.....	83.9	83.0	84.6	74.2 ^c
New Brunswick.....	61.8	66.0	81.9	77.0
Quebec.....	36.2	58.0	73.7	84.0 ^d
Ontario.....	60.4	70.2	64.9	69.2 ^e
British Columbia.....	74.6	72.6	46.8	51.0 ^f
Canada.....	65.2	69.1	64.7	69.8
	thousands			
Total trees in bearing.....	4,238	3,732	3,067	3,053

^a All trees, 10 years and older: taken from *Census of Canada, Agriculture*, Dominion Bureau of Statistics.

^b 25 or more trees, 10 years and older: taken from *Census of Canada, Agriculture*, Dominion Bureau of Statistics.

^c Trees 8 years and older: taken from 1966 Annapolis Valley Apple Tree Survey, Dominion Bureau of Statistics and Nova Scotia Department of Agriculture and Marketing.

^d Trees 10 years and older: estimates of the Quebec Department of Agriculture and Colonization.

^e Trees 8 years and older on standard rootstock; 6 years and older on size-controlling rootstock: taken from 1966 Fruit Tree Census, Ontario Department of Agriculture and Food.

^f Trees 10 years and older: taken from British Columbia Tree Fruits Limited (Okanagan and Kootenay).

In 1966, about 70 per cent of the apple trees in Canada were bearing (Table 4). Based on the general assumption that about a quarter of the tree population should be of young non-bearing trees to maintain constant production, Canada appears to be in a favorable position to supply apples for some years.

Production potential, nevertheless, varies among the provinces. In British Columbia, about 50 per cent of the trees were less than 10 years old in 1966. Extensive killing of trees by frost prior to 1966 resulted in new plantings.

In Ontario, about 70 per cent of the trees were of bearing age in 1966, approximately the Canadian average. In Nova Scotia and New Brunswick about 75 per cent were of bearing age. Estimates of recent plantings in Nova Scotia indicate that about 35,000 trees will come into bearing there each year beginning with the 1969 season (2).

In Quebec, in 1966, 84 per cent of the apple trees were of bearing age. The proportion of non-bearing trees has declined steadily since 1941. This indicates that production in Quebec has little potential for increase in the near future. Some preliminary data for 1969 show a slight decrease in the proportion of

bearing trees, indicating a higher rate of new plantings (3).

Yields

The decline in tree population has been offset by an increase in the average yield of apples per tree. Yield per tree more than doubled during the period 1941-66, from 3.1 bushels to 6.8 bushels (Table 5). Average yields increased in all provinces. The planting of earlier-maturing and shorter-living dwarf and semi-dwarf trees has increased in recent years. Yields from these trees are somewhat lower than those from standard trees but plantings are much denser per acre. Reliable comparisons of yields per tree or per acre cannot be made with earlier years.

As with average yields per tree, acreage yields must be assessed with regard to the variety, rootstocks, age, etc. For Canada, the average yield per acre of apples increased from 81 bushels to 217 bushels between 1941 and 1966 (Table 6). Corresponding increases occurred in the five apple-growing provinces.

TABLE 5—ESTIMATED AVERAGE YIELD PER APPLE TREE, BY PROVINCE, CANADA, 1941, 1951, 1961 AND 1966

	Nova Scotia	New Brunswick	Quebec	Ontario	British Columbia	Canada
	bushels per tree					
1941 ^a	2.4	2.0	1.6	2.9	4.8	3.1
1951 ^b	2.1	3.3	3.3	3.3	5.7	3.6
1961 ^b	6.4	5.5	3.3	6.2	6.4	5.4
1966.....	6.4 ^c	4.8	4.2 ^d	7.3 ^e	10.7 ^f	6.8

^a All trees: taken from *Census of Canada, Agriculture*, Dominion Bureau of Statistics.

^b 25 or more trees: taken from *Census of Canada, Agriculture*, Dominion Bureau of Statistics.

^c 1966 Annapolis Valley Apple Tree Survey, Dominion Bureau of Statistics and Nova Scotia Department of Agriculture and Marketing.

^d Estimates of the Quebec Department of Agriculture and Colonization.

^e 1966 Fruit Tree Census, Ontario Department of Agriculture and Food.

^f British Columbia Tree Fruits Limited (Okanagan and Kootenay).

TABLE 6—APPLES, ESTIMATED AVERAGE YIELD PER ACRE, BY PROVINCE, CANADA, 1941, 1951 AND 1966

	Nova Scotia	New Brunswick	Quebec	Ontario	British Columbia	Canada
	bushels per acre					
1941.....	93.0	84.6	35.1	39.5	183.9	81.1
1951.....	77.5	117.7	105.2	84.8	211.7	115.5
1966.....	229.6	201.2	165.9	171.5	336.6	216.9

Sources: (1) *Census of Canada, Agriculture*, Dominion Bureau of Statistics.

(2) *Handbook of Agricultural Statistics, Part V*, Cat. No. 21-512, Dominion Bureau of Statistics.

TABLE 7—APPLE PRODUCTION BY PROVINCE, SELECTED YEARS 1941-45 TO 1969

	1941- 1945	1946- 1950	1951- 1955	1956- 1960	1961- 1965	1966	1967	1968	1969*
thousand bushels									
Nova Scotia.....	3,711	3,587	1,932	2,217	2,864	2,962	3,500	2,790	3,600
New Brunswick.....	249	336	324	395	475	450	500	500	475
Quebec.....	766	1,469	2,748	3,384	5,167	4,100	5,160	6,604	5,330
Ontario.....	1,848	2,684	3,130	3,859	5,584	5,933	5,942	6,080	6,733
British Columbia.....	5,832	8,447	6,092	5,243	6,504	7,697	6,737	5,101	5,657
Canada.....	12,405	16,522	14,226	15,098	20,594	21,042	21,839	20,075	21,795

* First Estimate, Dominion Bureau of Statistics.

Source: *Crop and Seasonal Price Summaries*, Canada Department of Agriculture.

Production

During the 1941-45 period Canadian apple production averaged 12.4 million bushels a year, during 1956-60 it was 15.1 million bushels, and during the past five years averaged 21.0 million bushels (Table 7). There appears to be a potential for further increases in production. A 25 million bushel crop is a possibility in any year when weather conditions are favorable all across Canada, and may soon be an average annual production.

Trends in production vary among provinces. Production in Nova Scotia at 3.6 million bushels in 1969 is about the same as the average during the 1940's. Production in that province decreased during the 1950's but has been increasing during the past decade. Production in British Columbia in recent years has been slightly below the average production of the 1940's. Apple production in Quebec has increased from an average of 766,000 bushels during 1941-45 to more than 5 million bushels during the 1960's. Ontario production increased from 1.8 million bushels to more than 6 million. Ontario and Quebec, with the largest markets in Canada, have changed from deficit areas to being almost self-sufficient within the lifespan of a standard apple tree orchard. Production in New Brunswick has doubled in volume since 1941 but it is only about 2 per cent of total Canadian production.

Varieties

The varietal changes in world production in the past few years have been noticeably towards the Delicious variety. The dominance of this apple in the United States and in its exports has been a strong factor influencing changes in European production. In 1966, the Golden Delicious comprised more than half of the French apple crop. Red and Golden Delicious now dominate Italian production, the gains being at the expense of other varieties. It is

expected that the 1970 crop in Spain, another leading European producer, will be 45 per cent Delicious. In Canada however, the McIntosh is by far the most popular variety comprising nearly half the total crop and half or more of each provincial crop except in British Columbia and Nova Scotia (Table 8). As a proportion of the national crop, the McIntosh increased from about 29 per cent in 1949-51 to 49 per cent in 1969.

As a result of the dislocation of Canada's export markets by World War II there was a concerted effort to grub out unpopular and less efficient varieties and orchards. There are few data available that show Canadian production by variety as far back as 1941. It can be assumed that the reduction in sales to European markets resulted in decreased interest in the varieties grown for those markets. Equally, there was an increase in those varieties more popular on the home market. Another factor which was to become significant was the increasing use of controlled atmosphere (CA) storage. As well, there have been efforts to introduce better yielding varieties and strains.

The Delicious and Spy continue to be the second and third most popular Canadian apple varieties. The Cortland is proving popular as both a table and a processing variety. The Spartan, a cross between a McIntosh and a Newtown that contributed a special combination of the best qualities of these varieties is becoming more popular. Losing favor are the Wine-sap, Newtown, Fameuse and Jonathan. Dual purpose apples, for fresh table use and for processing (for example, Spy, Cortland and Golden Delicious) are showing a very slight increase in production. A stability in production and ranking of importance may be noticed for the processing varieties such as Spy and Greening, which reflects the trend to processing. The concentration on production of the McIntosh may make the Canadian industry, especially in Central Canada, vulnerable to a shift in consumer preference.

TABLE 8—APPLE PRODUCTION BY VARIETIES^a, CANADA AND REGIONS, 1949-51 AND 1969

	Canada		Nova Scotia		New Brunswick		Quebec		Ontario		British Columbia ^b	
	1949-51	1969 ^c	1949	1969 ^c	1951	1969 ^c	1951	1969 ^c	1949	1969 ^c	1950	1969 ^c
thousand bushels												
McIntosh.....	5,597	11,163	348	750	169	275	1,714	5,400	1,110	3,147	2,556	1,591
Delicious.....	2,915	3,228	254	475	4	—	—	—	260	587	2,397	2,166
Spy.....	1,037	2,173	251	400	—	—	—	—	786	1,773	—	—
Winesap.....	843	633	—	—	—	—	—	—	—	—	843	633
Cortland.....	374	755	120	280	67	100	102	375	85	—	—	—
Spartan.....	—	364	—	—	—	—	—	—	—	—	—	364
Fameuse (snow).....	465	245	—	—	—	—	465	200	—	—	—	—
Jonathan.....	772	—	—	—	—	—	—	—	34	—	738	18
Gravenstein.....	—	350	—	350	—	—	—	—	—	—	—	—
Lobo.....	—	380	—	—	—	30	—	350	—	—	—	—
Newtown.....	703	180	—	—	—	—	—	—	—	—	703	180
Wagener.....	501	240	427	240	—	—	74	—	—	—	—	—
Russet.....	—	160	—	—	—	—	—	—	—	—	—	—
Melba.....	221	—	—	—	10	—	146	250	65	—	—	—
King.....	—	220	—	220	—	—	—	—	—	—	—	—
Romes.....	—	103	—	—	—	—	—	—	—	—	—	43
Greening.....	—	223	—	—	—	—	—	—	—	223	—	—
Stark.....	383	—	318	—	—	—	—	—	65	—	—	—
Golden Russet.....	—	—	—	160	—	—	—	—	—	—	—	—
Gano.....	—	—	—	100	—	—	—	—	—	—	—	—
Baldwin.....	—	—	—	75	—	—	—	—	—	—	—	—
Ben Davis.....	—	—	—	110	—	—	—	—	—	—	—	—
Ribston.....	—	—	—	100	—	—	—	—	—	—	—	—
Rome Beauty.....	—	—	—	60	—	—	—	—	—	—	—	—
Winter.....	—	—	—	—	—	40	—	210	—	481	—	—
Early.....	—	—	—	—	—	55	—	145	—	179	—	—
Transparent.....	—	—	—	—	—	—	—	80	—	—	—	—
Duchess.....	—	—	—	—	—	—	—	60	—	—	—	—
Wealthy.....	—	—	—	—	—	—	—	—	—	131	—	—
Snow.....	—	—	—	—	—	—	—	—	—	77	—	—
Fall.....	—	—	—	—	—	—	—	—	—	206	—	—
Others.....	5,289	2,751	2,024	400	110	—	599	—	1,011	—	1,545	79
Total.....	19,100	23,168	3,742	3,720	360	500	3,100	7,070	3,416	6,804	8,782	5,074

^a There is no standard procedure for reporting production of apples by variety. Estimates of production are first made prior to harvest and later adjusted to conform with total crop estimates. The data in this table have been obtained from a variety of sources. Some did not report all varieties grown in the province, therefore, the table does not balance.

^b Okanagan and Kootenay.

^c Preliminary.

Source: Provincial Surveys, Fruit and Vegetable Division, Canada Department of Agriculture.

Orchardists in British Columbia grow more Delicious than McIntosh. Ontario and Nova Scotia have increased production of the Delicious varieties but not as much as that for McIntosh. The greatest reduction in varieties has taken place in Nova Scotia although orchardists there still produce more varieties than any other province. This province also has a larger proportion of the processing varieties than other provinces. The varieties grown in Quebec are mostly for fresh table use with the McIntosh in greater proportion than elsewhere in Canada. McIntosh production has increased considerably in Ontario as has that of the Spy varieties. Other processing apples such as the Greening and the Wealthy continue to be grown in appreciable quantities. Delicious production has doubled since 1949 but is still only about 8 per cent of the total in 1969, the same as it was 20 years earlier.

More McIntosh has been planted in recent years in Nova Scotia than any other variety. During 1968

it was the largest single variety planted, about 30 per cent of the total. In British Columbia about 63 per cent of the new plantings were Red and Golden Delicious with the former dominant. In Ontario, the Red and Golden Delicious varieties are challenging the Northern Spy as the second most popular apple.

Dr. D. V. Fisher, Head, Pomology Section, Canada Department of Agriculture, Research Station, Summerland, British Columbia, in a recent article "Spur-Type Strains of McIntosh for High Density Plantings" said "Discovery in the Okanagan Valley, British Columbia, of several good strains of spur-type McIntosh will probably mark a turning point in the history of the variety." He said that because of growth habits and other desirable characteristics of this type, "the potential economic picture for McIntosh production has become much more attractive than it has been in recent years"(4).

TABLE 9—CONTROLLED ATMOSPHERE STORAGE FOR APPLES, CANADA, 1959, 1966, 1969

	1959	1966	1969
	thousand bushels		
Nova Scotia.....	72	162	275
New Brunswick.....	6	45	66
Quebec.....	170	1,224	1,585
Ontario.....	443	1,025	1,198
British Columbia.....	19	730	1,374
Total.....	710	3,186	4,498

Source: Fruit and Vegetable Division, Canada Department of Agriculture.

Controlled Atmosphere Storage

The marketing of apples in Canada may be divided into three periods, the first prior to hard frosts during which early varieties and those that are less storable are marketed. The second begins before the end of November when cold and common storage apples begin to go to the market. The third period begins with the opening of the controlled atmosphere storages sometimes as early as the middle of January (5).

The development of controlled atmosphere (CA) storage has had a remarkable impact on Canadian apple production. It has been an important factor in the production shift from "winter storage" apples to varieties such as the McIntosh and particularly the Golden Delicious that would ordinarily have a much shorter storage life. Controlled atmosphere storage permits the grower to store for favorable markets, home or exports, and offer a high quality apple up to and into the beginning of the next marketing cycle.

In 1959 the total capacity of CA storage in Canada was 710,000 bushels (Table 9). Ten years later this had increased to 4,498,000 bushels. Practically all of this storage is for apples. Based on 1968 crop estimates of the major producing provinces, British Columbia had the largest CA storage capacity, 27 per cent, in relation to its crop. Quebec was next at 24 per cent. Ontario was third at 19 per cent and Nova Scotia last at about 10 per cent. Nova Scotia processes the largest proportion of its crop, so presumably this area has the least need for CA storage. Quebec processes the smallest proportion of its crop and needs a large storage capacity for fresh sales. British Columbia ranked first probably because of a small crop that year. An average B.C. crop of about 7 million bushels would place the

CA storage capacity at about 19 per cent of the crop.

Other Technical Developments

Technical developments have kept the Canadian apple industry a top competitor in worldwide markets. For instance, spray thinning now reduces the incidence of biennial bearing thus reducing the variability in production. Aerial spraying has become a practical possibility for many large growers. Leaf analysis for nutrient content is widely practiced providing the grower with reliable guides for fertilizing. Labor costs for harvesting processing varieties will be reduced by mechanical harvesters now being developed. Pre-storage hydro-sizing and grading will greatly modify the handling and marketing of apples by reducing costs and producing a nearly bruise-free apple for the consumer. Containerization of apples for offshore export markets has already been used in trial shipments effecting savings from damage and pilferage. Corner and side boards are now being used in palletized shipments which will improve handling of apples and their condition upon arrival at destination.

DISPOSITION

There have been substantial changes in the disposition of the Canadian apple crop during the past three decades (Tables 10, 11, 12). Prior to World War II exports averaged about 6 million bushels. During the war the average was about 1,800 bushels. Exports never reached pre-war levels again. Exports increased slightly after the war, decreased more or less steadily during the 1950's and increased slowly but with fluctuations during the 1960's.

TABLE 10—DISPOSITION OF THE CANADIAN APPLE CROP, SELECTED YEARS, 1934-39 TO 1968-69

	Production	Fresh Exports		Processed		Available for fresh consumption	
	thousand bushels	thousand bushels	percentage of crop	thousand bushels	percentage of crop	thousand bushels	percentage of crop
1934-35 to 1938-39							
average.....	14,093	6,483	46.0	1,965	13.9	5,645	40.1
1941-42.....	10,725	1,792	16.7	3,592	33.5	5,341	49.8
1946-47.....	19,282	5,986	31.0	5,469	28.4	7,827	40.6
1951-52.....	13,610	2,185	16.0	3,237	23.8	8,188	60.2
1956-57.....	12,424	1,407	11.3	3,702	29.8	7,315	58.9
1961-62.....	16,521	2,681	16.2	5,177	31.3	8,663	52.5
1966-67.....	21,042	2,996	14.2	7,936	37.7	10,110	48.1
1967-68.....	24,491	3,369	13.7	7,717	31.5	13,420	54.7
1968-69.....	20,150	3,007	14.9	5,738	28.4	12,359	61.3
1969 ^a	21,795						

^a First Estimate, Dominion Bureau of Statistics.

Source: *Crop and Seasonal Price Summaries*, Canada Department of Agriculture.

TABLE 11—SALES OF APPLES TO PROCESSORS BY PROVINCE, SELECTED YEARS 1941-42 TO 1968-69

	Nova Scotia	Quebec	Ontario	British Columbia	Total
	thousand bushels				
1941-42.....	2,234	—	916	443	3,593
1946-47.....	3,059	—	669	1,681	5,409
1951-52.....	971	268	1,139	859	3,237
1956-57.....	1,506	387	1,162	647	3,702
1961-62.....	1,921	229	2,257	770	5,177
1966-67.....	2,095	589	2,829	2,423	7,936
1967-68.....	2,561	805	2,942	1,467	7,775
1968-69 ^a	2,047	995	1,989	707	5,738

^a Preliminary.

Source: *Crop and Seasonal Price Summaries*, Canada Department of Agriculture.

TABLE 12—CANADIAN EXPORTS OF APPLES BY COUNTRIES, SELECTED YEARS 1934-38 TO 1968-69

	United States	United Kingdom	South America	Other	Total
	thousand bushels				
1934-38					
average.....	—	—	—	—	6,483
1941-42.....	4	1,527	191	8	1,730
1946-47.....	1,022	4,492	211	105	5,830
1951-52.....	1,111	994	7	73	2,185
1956-57.....	692	645	41	29	1,407
1961-62.....	869	1,325	10	477	2,681
1966-67.....	1,264	944	73	715	2,996
1967-68.....	1,965	866	40	498	3,369
1968-69.....	2,053	575	3	376	3,007

Source: *Crop and Seasonal Price Summaries*, Canada Department of Agriculture.

Concurrent with this change was an increase in fresh consumption and in processing. Fresh consumption increased from an average of 5.6 million bushels before the war to 6.9 million bushels during the war or from 40 per cent to 53 per cent of the crop. A greater change however took place in processing. Before the war, an average of less than 2 million bushels was processed, about 14 per cent of the crop. During the war the quantity processed increased to 4 million bushels or about 32 per cent of the crop. After the war, the proportion varied from a low of 19 per cent to a high of almost 35 per cent of the crop. In recent years the proportion processed has been more or less stable at about a third of the crop, slightly more than 7 million bushels.

The disposition of the crop is quite different on a provincial basis. In Nova Scotia about 70 per cent of the crop was processed during the 1962-66 period. Sixteen per cent went into fresh consumption within the province, 3 per cent was shipped to other provinces and 11 per cent was exported in the fresh state. The 1968-69 preliminary estimate for processing was 73 per cent and for export 7.1 per cent.

For Quebec the average crop during 1962-66 was disposed of as follows: 74 per cent to the fresh market within the province; 14 per cent to processing; 6 per cent moved into export and the balance went to other provinces. During 1968-69 the disposition was estimated as follows: processing, 17.7 per cent; exports, 10.3 per cent.

In Ontario during 1962-66 about 48 per cent of the crop was sent to the fresh market within the province. Processors used 41 per cent, about 5 per cent was exported and the balance moved interprovincially. In 1968-69 the disposition was different. The available estimates indicate Ontario processors took 32 per cent of the crop and exports about 9.4 per cent.

The British Columbia crop averaged about 7 million bushels during 1962-66. Nearly 12 per cent of the crop was utilized in the province, 32 per cent

moved into export and about 28 per cent moved interprovincially. Estimates indicate that in 1968-69 exports were 34.2 per cent and processing 13.8 per cent of the crop.

Most of the difference between the 1968-69 disposition and that during 1962-66 may be accounted for by the short North American supply situation and the changes in world markets, particularly those in Europe, caused by the increase in world production. Other factors influencing the disposition of recent apple crops are the color, variety and relative freshness of imported apples. (For prices see *A Study of the Marketing of Canadian Apples in Relation to the Feasibility of a National Marketing Board*, Marketing and Trade Division, Economics Branch, Canada Department of Agriculture, March 1969). Beginning in 1966-67 there has been an increase in imports of apples from the Southern Hemisphere (Table 13). Most of the imports consist of a green colored apple known as the Grannysmith. Almost all of them are imported in May and June. Probably because of having been harvested comparatively recently, they have gained a certain preference over the Canadian storage apple. This is some evidence that a "green" apple can influence the consumption of the long favored "red" apple. In further support of the vulnerability of the "red" apple is the increasing import of the Golden Delicious from the United States, and more recently but to a much more limited extent, from France.

CONCLUSIONS

Canadian apple growers may have some difficult problems to overcome in the near future because of increasing world production and declining export markets. The combination of potential yield, increased tree numbers and favorable growing conditions in Canada and the United States could result

TABLE 13—CANADIAN IMPORTS OF APPLES BY COUNTRIES, SELECTED YEARS 1941-42 TO 1968-69

	United States	Other	Total
	thousand bushels		
1941-42	309	—	309
1946-47	361	1	362
1951-52	371	28	399
1956-57	1,012	23	1,035
1961-62	1,366	53	1,419
1966-67	988	117	1,105
1967-68	837	640	1,477
1968-69	865	389	1,254

Source: *Crop and Seasonal Price Summaries*, Canada Department of Agriculture.

in a crop of 180 to 190 million bushels in any season. A crop of 30 to 32 million bushels in Canada and 150 to 160 million bushels in the United States is an imminent possibility. Such a crop would be more than a bushel (45 pounds) of apples per person in Canada and somewhat less than that in the United States. (The per capita consumption of apples in Canada during 1964-65 was estimated at 40 pounds and for the United States it was 25.3 pounds.) (5) Under these circumstances the supply would be much greater than demand and prices would fall in both countries.

Provided growing conditions are not exceptionally favorable in all areas at one time, that plantings are not increased beyond replacements and net trade remains about the same for the next few years, the natural population growth and a slight increase in per capita consumption should help the Canadian apple industry remain a viable and stable section of the economy.

Canadian consumption projections for apples to 1980 indicate an increase of 15 per cent to 46 pounds per capita (6). This is a 6 pound increase and is comprised of 0.5 pounds of fresh and 5.5 pounds of processed apples. The half-pound increase in fresh apples will come as a result of an increasing demand for special types and varieties and from superior quality apples. The larger increase of 5.5 pounds in processed apples is compatible with earlier increases of the same amount over a similar period of time. New apple products are constantly being developed and those that extend the use of apples rather than simply providing a substitute for another form of apple will help increase per capita consumption. Preliminary estimates of per capita consumption of fresh and processed apples for 1967 show an increase of 3.3 pounds above the 1964-66 average of 40 pounds per capita. Should this trend continue the extra 2.7 pounds per person could be reached by 1980 and the projected level of 46 pounds will be achieved.

The average population during 1964-66 was 19.6 million and estimates for 1980 indicate 26 million persons or an increase of 32.5 per cent. On the basis of a 45-pound bushel, we might be able to market an apple crop of 30 million bushels provided the current rate of export (3 million bushels) continues.

Applying apple production and population growth rates to the United States, that country should be able to handle its crop. Since population is increasing at a rate of 1.7 per cent per year and apple production at about 1.6 per cent per year with consumption rates constant, demand should be greater than supply in the United States.

With world production increasing, it may be difficult for Canada to continue to export the usual 3 mil-

lion bushels a year. Plantings therefore should be restricted (with a careful watch on varietal demand) to those needed to maintain rather than expand production.

There has been an increasing interest in the planting of intensive type orchards with dwarf and semi-dwarf trees. These orchards are cheaper to harvest and have a greater production potential but their establishment and operating costs are relatively high. Earlier maturity and shorter life compared with other orchards however, introduce a greater adaptability into the apple-growing industry and thus greater potential for meeting changes in consumer taste.

Further consideration should be given by growers in the apple-producing provinces to acting in concert with other producers to provide a united approach for working out solutions to those industry problems concerned with rising world production, the concentration of buying power in the hands of a few and the affects of intra-industry competition. The importation of apples is only one threat to the well-being of the apple producer and while imports may not be completely controllable, at least a uniform approach could mitigate some of the disturbing effects.

It seems entirely possible that more apples should and will go into processing in order to ensure the greatest possible return to the producer. The processor also has needs which might be best dealt with by a unified approach.

Most fresh apples are sold through a small number of large retailers. Rather than dealing with them on an individual basis there is a much better chance of reducing some of the built-in marketing margin by making a common approach.

And, finally, if the near future brings a surplus of apples, ways and means of promoting increased home consumption and sales on the export market are best accomplished by group effort.

NOTES AND REFERENCES

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- (4) *British Columbia Fruit Growers Association Quarterly Report*, Vol. 14, No. 2, September 1969.
- (5) *Fruit Situation*, August 1969, Economic Research Service, United States Department of Agriculture.
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COSTS AND RETURNS ON WHEAT FARMS, CENTRAL SASKATCHEWAN

E. A. K. Graholm

A continuing study of "Changes in Farm Organization" was started in 1954 in the Prairie Provinces. This article will consider some of the data from three of these studies conducted in 1959, 1964 and 1968. In 1959 and 1964 the survey area included 23 townships in the vicinity of the town of Davidson. The farms in the 1968 study were located in 13 neighboring townships serviced by the towns of Elbow, Loreburn, Strongfield and Hawarden. The farms in these areas are on medium textured soils within the Dark Brown soil zone. The productivity of soil on the survey farms was classified as moderately productive.

An estimate made from data in the *Census of Agriculture, 1966*, showed that there were 14,626,402 improved acres in the Dark Brown soil zone in Saskatchewan in 1966. Of these, 8,654,688 acres were under crop, with 6,867,925 acres, or 79 per cent, seeded to wheat. Each of the farm organization studies covered an average of 35,765 improved acres, of which approximately 20,812 acres were under crop. Wheat accounted for almost 91 per cent of the seeded acreage as averaged over the 3 study years.

This paper will report on some aspects of farm organization on medium and large wheat farms. Farms with four to six quarter sections were classified as medium; farms of six to nine quarter sections were classified as large. A wheat farm was defined as one with at least 70 per cent of seeded acres in wheat, and with no cattle or only a few kept for home consumption. In all the studies the record year ran from "after harvest" to "after harvest". Receipts from grain were from crops planted and harvested in the record year.

There was little difference in wheat yields among the 3 crop years, although all were slightly below the 20-year average (1949-68) for this area, 15.5 bushels per acre. Wheat averaged 15.0 bushels per acre in 1959, with No. 3 and No. 4 Northern the common grades. Wheat yields in 1964 were a little lower, 13.0 bushels per acre, but the common grade was No. 2 Northern. In 1968 the yield averaged 14.5 bushels per acre, and the common grades were No. 3 and No. 4 Northern (tough). A very wet harvesting season in the survey area was responsible for damp and tough grades in 1968.

FARM ORGANIZATION

Land Use

The proportion of improved land to total farm area was high on both sizes of farms (Table 1). Cropland averaged 96 per cent of farm area on the medium size farms, and 94 per cent on large farms. Medium farms had 83 to 96 per cent of seeded acres sown to wheat, while the large farms had 86 to 96 per cent in wheat. The other significant crops, oats, barley, flax and rye, showed a declining importance. This was consistent with the provincial trend toward more wheat acreage at the expense of other crops. The proportion of stubble crops averaged 27 per cent on medium grain farms and 20 per cent on large farms. The acreage in summerfallow on medium grain farms varied from 44 per cent to 37 per cent. Summerfallow on large farms varied from 43 per cent to 40 per cent of total cropland.

TABLE 1—LAND UTILIZATION ACCORDING TO SIZE OF FARM, CENTRAL SASKATCHEWAN, 1959, 1964, 1968

	Medium Farms			Large Farms		
	1959	1964	1968	1959	1964	1968
average acres per farm						
Wheat.....	290	330	359	522	548	627
Barley.....	17	4	3	23	4	8
Flax.....	23	13	3	49	25	—
Oats.....	12	4	—	5	2	—
Rye.....	—	12	4	—	—	3
Tame forage, pasture and other.....	7	1	4	7	2	14
Summerfallow.....	269	234	219	463	488	430
Total cropland.....	618	598	592	1,069	1,069	1,082
Farmstead and unimproved.....	27	29	25	106	43	47
Total farm area.....	645	627	617	1,175	1,112	1,129
Number of farms.....	22	20	22	21	20	23

Livestock

Hogs, and poultry were of little importance on all the sample farms. None of the farms reported any sheep. Hogs were reported on 10 farms in 1959, 5 farms in 1964 and on 2 farms in 1968. The number of farms reporting poultry also dropped considerably, from 19 in 1959 to 6 in 1968. The average number of poultry and hogs on farms was small, due in part to the fact that farms with large hog or poultry enterprises were not considered typical wheat farms, and thus excluded from the survey. Similarly, the number of cattle on these farms was restricted by the definition of a wheat farm. The number of farms

reporting cattle declined from 13 to 2 from 1959 to 1968.

Farm Labor

Almost all labor on the medium farms was supplied by the operator and his family (Table 2). Large farms had considerably more hired labor in 1959 than the medium farms, but by 1968 there was little hired labor on either size of farm. Much of this decrease can be attributed to larger, more efficient farm machinery. Most of the hired labor was employed during seeding and harvesting operations.

TABLE 2—AMOUNT OF LABOR USED ON FARMS ACCORDING TO SIZE OF FARM, CENTRAL SASKATCHEWAN, 1959, 1964, 1968

	Medium Farms			Large Farms		
	1959	1964	1968	1959	1964	1968
	average months per farm					
Hired labor.....	0.4	0.2	0.5	1.6	0.8	0.6
Unpaid family labor.....	0.9	0.3	0.2	0.3	0.5	0.1
Operator.....	10.2	8.0	7.2	8.3	9.5	8.0
Total.....	11.5	8.5	7.9	10.2	10.8	8.7
Number of farms.....	22	20	22	21	20	23

TABLE 3—AVERAGE FARM CAPITAL ACCORDING TO SIZE OF FARM, CENTRAL SASKATCHEWAN, 1959, 1964, 1968

	Medium Farms						Large Farms					
	1959		1964		1968		1959		1964		1968	
	dollars	per cent	dollars	per cent	dollars	per cent	dollars	per cent	dollars	per cent	dollars	per cent
Land.....	16,550	52.2	34,275	66.2	44,922	70.7	30,180	57.4	57,145	67.8	85,297	74.5
Deflated to 1959.....	—	—	16,550	51.5	16,550	53.2	—	—	30,180	55.6	30,180	57.0
Buildings.....	3,455	10.9	3,475	6.7	2,072	3.2	4,870	9.2	4,710	5.6	3,445	3.0
Deflated to 1959.....	—	—	3,120	9.7	1,561	5.0	—	—	4,229	7.8	2,595	4.9
Machinery and equipment.....	11,309	35.6	13,692	26.4	16,473	25.9	17,192	32.7	22,274	26.4	25,693	22.5
Deflated to 1959.....	—	—	12,126	37.7	12,916	41.5	—	—	19,726	36.3	20,146	38.1
Livestock.....	414	1.3	365	.7	102	.2	362	.7	177	.2	1	.d
Deflated to 1959.....	—	—	360	1.1	92	.3	—	—	175	.3	1	.d
Total.....	31,728	100.0	51,807	100.0	63,569	100.0	52,604	100.0	84,306	100.0	114,436	100.0
Deflated to 1959.....	—	—	32,156	100.0	31,119	100.0	—	—	54,310	100.0	52,922	100.0
Number of farms.....	22		20		23		21		20		22	

^a Deflated to the average value of a similar size of farm in 1959.

^b Deflated to 1959 values using indexes from *Price Index Numbers of Commodities and Services Used by Farmers*, Dominion Bureau of Statistics.

^c Deflated to 1959 values on the basis of actual market values for livestock reported in each of the studies.

^d Less than 0.1 per cent.

Farm Capital

The value of real estate, including owned and rented land and buildings rose sharply from 1959 to 1968 (Table 3). Rather than attempting to evaluate how much of the increase in land value was due to inflation and how much was due to other reasons, the 1964 and 1968 land value figures were deflated to the average value of a similar size farm in 1959. Machinery and equipment were the only capital item which showed a real increase in investment from 1959 to 1968.

INCOME-EXPENSE SUMMARY

Farm Receipts

In computing the receipts from crop sales, it was assumed that the grain available for sale was the total production of the farm minus the amount used for seed and feed. Grain quotas in many years, notably 1968, make this assumption unrealistic, and thus, the net return per farm is exaggerated.

Miscellaneous farm income included such items

as payments under the Prairie Farm Assistance Act, acreage payments and claims for hail insurance (Table 4). In 1959, all the survey farms received \$200 in acreage payments, and 35 of the 43 farms had income from P.F.A.A. payments. Average total farm receipts per acre of cropland were lower on large grain farms than on medium grain farms. The receipts averaged \$11.14, \$12.32, and \$12.49 per acre of cropland on medium grain farms, and \$10.99, \$11.23, and \$12.32 on large grain farms in 1959, 1964 and 1968 respectively. In terms of 1959 dollars, the receipts per acre of cropland averaged \$10.19 and \$10.78 on medium farms, and \$9.44 and \$9.97 on large farms, in 1964 and 1968 respectively.

Farm Expenses

Real estate expenses included repairs, upkeep, taxes and insurance. Repairs and upkeep fluctuated from year to year while taxes and insurance remained fairly constant (Table 5). This misleading situation was a result of using different study areas.

TABLE 4—FARM RECEIPTS ACCORDING TO SIZE OF FARM, CENTRAL SASKATCHEWAN, 1959, 1964, 1968

	Medium Farms						Large Farms					
	1959		1964		1968		1959		1964		1968	
	dollars	per cent	dollars	per cent	dollars	per cent	dollars	per cent	dollars	per cent	dollars	per cent
Crop Sales.....	5,851	85.0	6,987	94.8	7,174	97.0	10,921	92.9	11,673	97.2	13,111	98.4
Deflated to 1959.....	—	—	5,721	93.9	6,177	96.8	—	—	9,775	96.8	10,587	98.1
Livestock sales.....	232	3.4	96	1.3	45	.6	162	1.4	81	.7	—	—
Deflated to 1959.....	—	—	95	1.5	40	.6	—	—	78	.8	—	—
Livestock inventory change.....	43	.6	80	1.1	-43	-.6	102	.8	-3	°	-10	-.1
Deflated to 1959.....	—	—	79	1.3	-39	-.6	—	—	-3	°	-9	-.1
Livestock products.....	110	1.6	59	.8	25	.3	—	—	42	.3	5	°
Deflated to 1959.....	—	—	59	1.0	22	.3	—	—	42	.4	4	°
Custom work.....	21	.3	49	.6	43	.6	100	.9	94	.8	52	.4
Deflated to 1959.....	—	—	42	.7	32	.5	—	—	82	.8	38	.4
Miscellaneous farm receipts.....	626	9.1	96	1.4	153	2.1	467	4.0	120	1.0	167	1.3
Deflated to 1959.....	—	—	96	1.6	153	2.4	—	—	120	1.2	167	1.6
Total receipts.....	6,883	100.0	7,367	100.0	7,397	100.0	11,752	100.0	12,007	100.0	13,325	100.0
Deflated to 1959.....	—	—	6,092	100.0	6,385	100.0	—	—	10,094	100.0	10,787	100.0
Number of farms.....	22		20		23		21		20		22	

° Receipts from crop sales were deflated using 1959 final Wheat Board payments.

^b These receipts were deflated to 1959 on the basis of actual market values for livestock and livestock products reported in each of the studies.

^c These receipts were deflated to 1959 using the appropriate index from *Price Index Numbers of Commodities and Services Used by Farmers*, Dominion Bureau of Statistics.

^d Miscellaneous farm income included such items as P.F.A.A. payments, acreage payments and claims for hail insurance. It was not deflated.

^e Less than 0.1 per cent.

TABLE 5—FARM EXPENSES ACCORDING TO SIZE OF FARM, CENTRAL SASKATCHEWAN, 1959, 1964, 1968

	Medium Farms						Large Farms					
	1959		1964		1968		1959		1964		1968	
	dollars	per cent	dollars	per cent	dollars	per cent	dollars	per cent	dollars	per cent	dollars	per cent
Cash Expenses												
Real Estate.....	521	13.0	661	13.9	587	11.3	974	15.8	1,096	16.1	1,060	13.8
Deflated to 1959*...	—	—	570	13.4	401	10.0	—	—	947	15.7	724	12.2
Crop.....	231	5.8	308	6.5	387	7.4	403	6.5	489	7.2	742	9.6
Deflated to 1959*...	—	—	288	6.8	331	8.2	—	—	442	7.3	635	10.7
Livestock.....	116	2.9	59	1.2	2	^b	39	.6	53	.8	1	^b
Deflated to 1959*...	—	—	58	1.4	2	.1	—	—	52	.9	1	^b
Machinery and equipment.....	1,051	26.2	1,187	24.9	1,315	25.3	1,811	29.4	1,664	24.4	1,932	25.1
Deflated to 1959*...	—	—	1,051	24.8	1,031	25.6	—	—	1,474	24.4	1,515	25.4
Custom work.....	90	2.2	96	2.0	54	1.0	29	.5	49	.7	104	1.4
Deflated to 1959*...	—	—	85	2.0	39	1.0	—	—	42	.7	76	1.3
Labor.....	96	2.4	52	1.1	150	2.9	241	3.9	164	2.4	180	2.3
Deflated to 1959*...	—	—	45	1.1	101	2.5	—	—	141	2.3	121	2.0
Miscellaneous farm expenses.....	131	3.2	181	3.8	196	3.8	139	2.2	215	3.1	243	3.1
Deflated to 1959*...	—	—	170	4.0	158	3.9	—	—	202	3.3	195	3.3
Total cash expenses.....	2,236	55.7	2,544	53.4	2,691	51.7	3,636	58.9	3,730	54.7	4,262	55.3
Deflated to 1959*...	—	—	2,267	53.5	2,063	51.3	—	—	3,300	54.6	3,267	54.9
Depreciation												
Buildings.....	269	6.7	336	7.0	287	5.5	380	6.2	398	5.8	409	5.3
Deflated to 1959*...	—	—	302	7.1	216	5.4	—	—	357	5.9	308	5.2
Machinery.....	1,507	37.6	1,887	39.6	2,224	42.8	2,152	34.9	2,691	39.5	3,032	39.4
Deflated to 1959*...	—	—	1,671	39.4	1,744	43.3	—	—	2,383	39.5	2,377	39.9
Total depreciation.....	1,776	44.3	2,223	46.6	2,511	48.3	2,532	41.1	3,089	45.3	3,441	44.7
Deflated to 1959*...	—	—	1,973	46.5	1,960	48.7	—	—	2,740	45.4	2,685	45.1
All expenses.....	4,012	100.0	4,767	100.0	5,202	100.0	6,168	100.0	6,819	100.0	7,703	100.0
Deflated to 1959*...	—	—	4,240	100.0	4,023	—	—	—	6,040	—	5,952	100.0
Number of farms.....	22		20		23		21		20		22	

* All expenses were deflated to 1959 using the appropriate index from *Price Index Numbers of Commodities and Services Used by Farmers*, Dominion Bureau of Statistics.

^b Less than 0.1 per cent.

The mill rate for farms in the Davidson area averaged 55.4 and 56.4 in 1959 and 1964 respectively. When the study was conducted in 1968 the survey farms were in a municipality with a mill rate of 58.0, a relatively low rate of taxation. Had the survey continued in the Davidson area in 1968, the mill rate would have been approximately 67.7, and taxes would have shown a substantial increase.

The use of custom work was quite different on the two sizes of farms. From 1959 to 1968, medium grain farmers performed more custom work on other farms, and hired less done on their own farms. Just the opposite was true of the large grain farms over these years; Tables 4 and 5 show this item as

an increasing expense and a decreasing source of income.

Financial Summary

The financial summary in Table 6 shows the net return to the operator and his family for labor, management and capital. The average net return per acre of cropland was \$5.46, \$5.28 and \$4.52 on medium farms, and \$5.81, \$5.45 and \$5.91 on large farms in 1959, 1964, and 1968 respectively. Expressed in 1959 values the average net return on medium farms was \$4.02 and \$4.80, and on large farms was \$4.39 and \$5.18 in 1964 and 1968 respectively.

TABLE 6—FINANCIAL SUMMARY ACCORDING TO SIZE OF FARM, CENTRAL SASKATCHEWAN, 1959, 1964, 1968

	Medium Farms						Large Farms					
	1959		1964		1968		1959		1964		1968	
	dollars	per cent	dollars	per cent	dollars	per cent	dollars	per cent	dollars	per cent	dollars	per cent
Receipts												
Cash receipts.....	6,883	93.2	7,367	93.0	7,397	93.9	11,752	94.9	12,007	95.0	13,325	94.5
Deflated to 1959 ^a ...	—	—	6,092	91.6	6,385	93.0	—	—	10,094	94.1	10,787	93.3
Perquisites.....	504	6.8	557	7.0	479	6.1	631	5.1	636	5.0	776	5.5
Deflated to 1959 ^b ...	—	—	557	8.4	479	7.0	—	—	636	5.9	776	6.7
Total receipts.....	7,387	100.0	7,924	100.0	7,876	100.0	12,383	100.0	12,643	100.0	14,101	100.0
Deflated to 1959 ^a ...	—	—	6,649	100.0	6,864	100.0	—	—	10,730	100.0	11,563	100.0
Expenses												
Cash expenses.....	2,236	55.7	2,544	53.4	2,691	51.7	3,636	58.9	3,730	54.7	4,262	55.3
Deflated to 1959 ^a ...	—	—	2,267	53.5	2,063	51.3	—	—	3,300	54.6	3,267	54.9
Depreciation costs....	1,776	44.3	2,223	46.6	2,511	48.3	2,532	41.1	3,089	45.3	3,441	44.7
Deflated to 1959 ^a ...	—	—	1,973	46.5	1,960	48.7	—	—	2,740	45.4	2,685	45.1
Total expenses.....	4,012	100.0	4,767	100.0	5,202	100.0	6,168	100.0	6,819	100.0	7,703	100.0
Deflated to 1959 ^a ...	—	—	4,240	100.0	4,023	100.0	—	—	6,040	100.0	5,952	100.0
Net return.....	3,375	—	3,157	—	2,674	—	6,215	—	5,824	—	6,398	—
Deflated to 1959 ^a ...	—	—	2,409	—	2,841	—	—	—	4,690	—	5,611	—
Number of farms.....	22		20		23		21		20		22	

^a These receipts and expenses are from Tables 4 and 5.

^b The value of home-consumed products was calculated using the same rates in each of the study years, and therefore, has not been deflated.

Debt

The average debt position of the survey farms was computed for medium and long-term debt only. Short-term debt (less than one year) was not included in the figures for total debt given in Table 7. The asset-liability ratio was computed for indebted farms only. Liability was the total debt outstanding, and the assets included only the owned assets of the indebted farms.

Medium-term debt, shown in Table 8, included debt of one to five years. The most common creditors were dealers, finance companies, private individuals and banks for loans under the Farm Improvement Loans Act. The average medium-term debt outstanding in 1968 was almost four times greater on large farms than on medium farms.

Long-term debt (over five years) was usually financed by banks and mortgage companies, Farm

TABLE 7—NUMBER OF INDEBTED FARMS AND AVERAGE AMOUNT OF DEBT ACCORDING TO SIZE GROUPS, CENTRAL SASKATCHEWAN, 1959, 1964, 1968

	Medium Farms			Large Farms		
	1959	1964	1968	1959	1964	1968
Number of indebted farms.....	11	10	15	11	8	15
Per cent of total.....	50.0	50.0	65.2	52.4	40.0	68.2
Average outstanding debt per farm						
Indebted farms.....	3,764	3,360	7,258	3,414	4,488	12,491
All farms.....	1,882	1,680	4,733	1,788	1,795	8,516
Ratio of Assets to Liabilities						
Indebted farms.....	7:1	13:1	7:1	13:1	13:1	6:1
Number of farms.....	22	20	23	21	20	22

Credit Corporation and Veterans' Land Act Administration, or through private individuals. The percentage of farms with long-term loans varied

from year to year, but the average amount of debt outstanding increased sharply from 1959 to 1968 (Table 9).

TABLE 8—MEDIUM-TERM DEBT ACCORDING TO SIZE OF FARM, CENTRAL SASKATCHEWAN, 1959, 1964, 1968

	Medium Farms			Large Farms		
	1959	1964	1968	1959	1964	1968
Number of indebted farms.....	5	8	13	6	6	15
Per cent of total.....	22.7	40.0	56.5	28.6	30.0	68.2
Average outstanding debt per farm	dollars					
Indebted farms.....	1,620	1,725	4,048	1,808	3,250	3,464
All farms.....	368	690	2,288	517	975	2,362
Average payment due annually						
Indebted farms.....	988	713	1,465	859	1,525	1,106
All farms.....	224	285	828	245	457	754
Number of farms.....	22	20	23	21	20	22

TABLE 9—LONG-TERM DEBT ACCORDING TO SIZE OF FARM, CENTRAL SASKATCHEWAN, 1959, 1964, 1968

	Medium Farms			Large Farms		
	1959	1964	1968	1959	1964	1968
Number of indebted farms.....	9	6	8	7	4	7
Per cent of total.....	40.9	30.6	34.8	33.3	20.0	31.8
Average outstanding debt per farm	dollars					
Indebted farms.....	3,700	3,300	7,031	3,814	4,100	19,343
All farms.....	1,514	990	2,445	1,271	820	6,155
Average payment due annually						
Indebted farms.....	368	493	760	594	503	990
All farms.....	150	148	264	198	101	315

POLICY AND ADMINISTRATION OF PUBLIC LANDS IN THE ATLANTIC REGION WITH PARTICULAR REFERENCE TO AGRICULTURE

G. C. Retson

In recent years increased attention has been directed towards resource development and particularly that associated with problems of rural and regional economic disparity. Since it represents a major component of the resource base research has been focused on various aspects of land including its capability, management and use for various purposes. Work has been mainly associated with privately owned land. The recognized need for more comprehensive land use planning suggests more emphasis on public or Crown lands. This raises a question about current programs being conducted on these lands and the extent to which they may be integrated in overall resource planning.

Policy and administration of public lands in the Atlantic region vary considerably reflecting differences in problems as well as in historical developments and current viewpoints of the respective provinces. Since agriculture is conducted mainly on privately owned land and much of the Crown land is unsuited to farming, many of these programs have only limited association with agriculture. At the same time, it may be noted that a considerable acreage currently held by the Crown was once classified as farm land. While related matters such as whether land should or should not remain in agriculture are involved, the main problem appears to be that of maintaining an interdisciplinary or multiple-use approach which gives consideration to the overall aspects of land use. Also of importance is the fact that on many of the isolated farms in the Atlantic region, forestry and to an increasing extent, recreation, is an important source of off-farm employment and income.

Legislation

The terms "public and Crown lands" are often used synonymously. "Public lands" is a general term used to refer to a wide variety of holdings, title to which is held by federal, provincial or local governments or their agents. Crown lands refer more specifically to those lands administered under authority of the Crown Lands Acts or comparable provincial legislation. In New Brunswick, the Crown Lands Act is administered by the Department of Natural Resources. In Nova Scotia, similar authority is vested in the Crown Lands Section of the Lands and Forests Act administered by the Department of Lands and Forests. In Newfoundland, the

Crown Lands Act is administered by the Department of Mines, Agriculture and Resources. In Prince Edward Island, similar but more limited authority is provided by the Prince Edward Island Forestry Act, administered by the Department of Agriculture.

In addition to the Crown lands, provincial governments hold title to other property, administration of which is not subject to provisions of the Crown Lands Act. In the Atlantic region this includes provincial community pastures as well as land associated with provincial government buildings and institutions. Federal lands in the Atlantic region include national parks, historical parks and sites, forest experimental stations, experimental farms, Indian reserves, and land held for purposes connected with the federal government administration.

Characteristics of Public Lands

Before proceeding with a discussion of individual policies or programs it may be of interest to review data on acreage, tenure and land use patterns in the Atlantic region particularly as they relate to public lands (Table 1). Public lands are a major portion of the land area of the region. In 1968 public lands administered by various agencies of federal and provincial governments amounted to 167,729 square miles or more than four-fifths of the total land area of the Atlantic region. Provincial holdings accounted for 99 per cent and federal lands 1 per cent of the total area of public land. On the basis of the acreage involved, it appears that public land policy is primarily a matter of provincial concern.

There is considerable variation in the relative amounts of public and privately-owned land as well as in land use patterns in the four Atlantic Provinces (Table 1). More than 95 per cent of the land area of Newfoundland consists of Crown lands administered by the province. The relatively small area in federal lands (324 square miles) reflects Newfoundland's relatively recent entry into Confederation. Land on privately-owned as well as on public holdings is largely in forest. Only 1.3 per cent of the area in private lands and 0.05 per cent of the total land area of the province were classified as occupied farm land in 1968. The low percentage of land in farming reflects the absence of land suitable for agriculture and the restrictions placed on settlement. Colonial

TABLE 1—TOTAL LAND AND WATER AREA OF THE ATLANTIC PROVINCES CLASSIFIED BY TENURE AND USE

	Newfoundland		Prince Edward Island		Nova Scotia		New Brunswick		Atlantic Provinces	
	square miles	per cent	square miles	per cent	square miles	per cent	square miles	per cent	square miles	per cent
Total land area.....	143,045	91.6	2,184	100.0	20,402	95.2	27,835	98.2	193,466	92.9
Total fresh water area.....	13,140	8.4	—	—	1,023	4.8	519	1.8	14,682	7.1
Total area of province.....	156,185	100.0	2,184	100.0	21,425	100.0	28,354	100.0	208,148	100.0
Tenure (circa) 1966										
Federal lands										
National parks.....	153	0.1	7	0.3	517	2.4	79	0.3	756	0.3
Indian reserves.....	—	—	4	0.2	40	0.2	59	0.2	103	0.1
Other.....	171	0.1	68	3.1	134	0.6	619	2.2	992	0.5
Total.....	324	0.2	79	3.6	691	3.2	757	2.7	1,851	0.9
Provincial lands										
Provincial parks.....	87	—	1	—	14	0.1	4	—	106	0.1
Provincial forests.....	117	0.1	6	0.3	—	—	1,407	5.0	1,530	0.7
Other.....	148,848	95.3	44	2.0	4,784	22.3	10,666	37.6	164,342	78.9
Total.....	149,052	95.4	51	2.3	4,798	22.4	12,077	42.6	165,978	79.7
Privately-owned land or land in process of alienation from the Crown.....										
Total area of province.....	156,185	100.0	2,184	100.0	21,425	100.0	28,354	100.0	208,148	100.0
Use in 1967										
Occupied agricultural land										
Improved.....	32	—	890	40.8	759	3.7	998	3.6	2,679	1.4
Unimproved.....	45	—	558	25.5	2,134	10.5	1,833	6.6	4,570	2.3
Total.....	77	0.1	1,448	66.3	2,893	14.2	2,831	10.2	7,249	3.7
Forested land (not on farms)										
Productive.....	33,841	23.6	376	17.2	13,386	65.6	22,365	80.3	69,968	36.2
Non-productive.....	53,930	37.7	122	5.6	1,194	5.9	442	1.6	55,688	28.8
Total.....	87,771	61.3	498	22.8	14,580	71.5	22,807	81.9	125,656	65.0
Other land.....	55,197	38.6	238	10.9	2,929	14.3	2,197	7.9	60,561	31.3
Total land area.....	143,045	100.0	2,184	100.0	20,402	100.0	27,835	100.0	193,466	100.0

Source: *Canada Year Book 1968*, pp. 7, 29 and 466, Dominion Bureau of Statistics.

policy generally banned agricultural settlement in Newfoundland until 1822 and in some areas territorial disputes severely restricted it until 1874.

In contrast to the situation in Newfoundland, 94 per cent of all land in Prince Edward Island is privately owned and 70 per cent of this is classified as occupied agricultural land. Aside from roads and a few public properties, most of the land in Prince Edward Island was alienated from the Crown in the early days of settlement. A considerable part of what is now public land was acquired from private owners. The relatively small area in public lands (130 square miles) plus the fact that 61 per cent of this is administered by federal agencies, indicates a much smaller provincial involvement in Crown land operations than exists in the other Atlantic Provinces.

A comparison of the New Brunswick and Nova Scotia data indicates the major variation is in the ratio of public to privately-owned lands. In New

Brunswick public lands account for 45.3 per cent of the total land area of the province. In Nova Scotia the comparable figure is considerably lower at 25.6 per cent. The higher ratio of public to private lands in New Brunswick reflects the influence of a slower rate of alienation of land during the settlement period and a more active program of acquiring Crown lands in recent years.

Acquisition

At Confederation nearly all of the land in Prince Edward Island and most of that in Nova Scotia had been alienated from the Crown. In New Brunswick the process was somewhat slower. Current holdings of Crown lands in these provinces thus in considerable part represent re-acquisition of land previously held by the Crown. In Prince Edward Island acquisitions of Crown land have been small and comparatively recent. Many of them consist of

forestry and provincial park areas acquired under the ARDA program.

The current program of adding to Crown land in Nova Scotia was initiated about 1930. The program followed repeated representations to governments that added land be acquired in the interests of conservation. It has frequently been suggested that a desirable goal would be ownership of land in approximately equal proportions by government, the large lumber companies (those with more than 1,000 acres), smaller lumber companies and farmers. The program has been facilitated by a substantial amount of farm abandonment and ability to purchase clear-cut woodland or slash at rates as low as \$1 per acre. In recent years added assistance has been provided under the ARDA program. Since the Government owns many scattered blocks of land, the operation includes an exchange as well as a purchase program so that blocks can be consolidated and managed more efficiently. Additions to Crown land amounted to 30,992 acres in 1967 and 34,524 acres in 1968.

The Crown Lands Act of New Brunswick provides for a Crown Lands sinking fund. Purchases of Crown lands are paid for out of this fund and proceeds from all sales of such lands are credited to it. The fund plus accrued interest which amounted to \$804,269 in 1965, has provided the basis for a substantial and continuing purchase program. Over the years purchases combined with exchanges of Crown land for freehold land has intensified and in 1967 a total of 221,322 acres were purchased and 1,624 acres of Crown land exchanged for 1,797 acres of freehold land. Despite these heavy purchases the Crown Lands sinking fund stood at \$341,164 in 1968. The downward trend in the area of occupied farm land in New Brunswick, a decrease from 4,151,596 acres to 1,811,695 acres during the 1931-66 period, presumably reflects the influence of this program.

Departmental reports provide no data on acquisition of Crown lands in Newfoundland in recent years and the extent of current holdings (all but 5 per cent of Newfoundland is publicly owned) provides little encouragement for such a program. Another factor is the absence of a system of municipal administration under which the considerable amount of abandoned or unused land known to exist in the province might revert to the Crown for non-payment of taxes.

Disposition

The Lands and Forests Act of Nova Scotia makes provision for grants of land to individuals provided;

“the Minister is satisfied that:

- (a) the land applied for is suitable for settlement and for agricultural or grazing purposes;
- (b) the petitioner desires the land for his own benefit, and for the purpose of actual settlement and for agricultural or grazing purposes;
- (c) the applicant is not less than eighteen years of age;
- (d) the land applied for does not exceed one hundred and fifty acres.”

Further provisions of the Act stipulate that:

- (a) “The price of such lands shall be one dollar per acre, in addition to the expenses of the survey of the lands so applied for, but no grant shall issue for a less sum than twenty-five dollars in addition to the expenses of the survey.
- (b) Every holder of a permit who has taken possession of the land described therein and within two years from the date thereof has built a house thereon and has resided upon the said land for not less than three successive years, and has cultivated not less than ten acres thereof shall be entitled to a grant of the said land upon payment of the balance of the purchase money . . . ” (1).

Because tillable land can generally be purchased at a fraction of the cost of clearing and developing Crown lands, operations of the Act insofar as agriculture is concerned have been of minor significance for a number of years. Reports of the Department of Lands and Forests for 1967 and 1968 report only 20 grants involving 514 acres of land and of these, 16 were for cottages. This is in sharp contrast to the 65,516 acres acquired by the Crown in the same two-year period. Aside from woods operations which may have involved farmers, the only reported Crown land operations specifically involving agriculture in the same two-year period were three leases; two for use of blueberry lands and one for grazing purposes.

Agricultural settlement in New Brunswick and particularly that in the northeast part of the province tends to be more recent than that in Prince Edward Island and Nova Scotia. The back-to-the-land movement of the 1930's which elsewhere in the Maritimes was confined largely to established farms involved a considerable amount of settlement on Crown lands in New Brunswick. This was administered by the Colonization Branch of the Department of Lands and Mines, currently named the Department of Natural Resources.

Aside from some variation in lot size (a maximum of 150 acres in Nova Scotia versus 110 acres in New Brunswick) the procedure for issue of grants of land was quite similar to that previously noted for Nova Scotia. By 1963, annual grants of land had declined to 16 and action was taken to phase out the operation. Provision for farmers to acquire farm lands, however, was maintained under an agreement with the New Brunswick Farm Settlement Board (later taken over by the Farm Adjustment Board) of the New Brunswick Department of Agriculture.

Since 1963, the annual number of grants for land settlement in New Brunswick has varied considerably, reaching a high of 135 in 1965 and a low of 6 in 1967. In 1968 a total of 88 grants was made. This increase in settlement grants in the 1964-68 period reflects action on a backlog of applications on file in 1963 rather than an increasing trend in settlement. Aside from forestry operations involving farmers, the main Crown land operations associated with agriculture in 1968 were 32 blueberry leases or permits. Holders of the 38 sugar-bush leases or licenses on record in 1968 probably also included a number of farmers.

In contrast to the situation in Nova Scotia and New Brunswick, issue of Crown lands for agriculture in Newfoundland is facilitated by relatively simple procedures. Following approval of the request by an interdepartmental committee, an applicant may lease up to 200 acres of Crown land for agricultural purposes for a period of 5 years. During this period the lessee must clear and cultivate 25 per cent of the land to qualify for a grant in fee simple. Rental for the lease is \$1 per year. Prior to 1967 the maximum area of such a lease was 50 acres. The 1967 report of the Department of Mines, Agriculture and Resources indicates that 54 leases and 44 grants of land for agricultural purposes were made during that year. The amount of land involved is not reported.

Agricultural Suitability of Lands

During the 30-year period prior to 1961 there was an annual movement of 1,823 farms and 141,820 acres of land out of agriculture in the Maritime Provinces. Comparable data for Newfoundland, available since 1951, indicate an annual movement of 187 farms and 3,048 acres of land out of agriculture. Most of this land has reverted to forest and a considerable part has been reconveyed to the Crown. Except for some scattered blocks of land, most of which are located in Northwestern New Brunswick, Crown lands in the Atlantic region are better suited to forestry than agriculture.

Improvement and Management

Because the best use of Crown land in the Atlantic region is for forestry, wildlife and recreation, related policies and programs are mainly involved with the protection and efficient management of these resources. From the point of view of the farmer their chief significance is the additional income they may provide in terms of off-farm employment or in the development of skills and knowledge which may be applied to advantage on the farm woodlot. A long-term benefit is the conservation of resources which may be required at some future date.

Farm Consolidation and Enlargement

The farm consolidation and land use program conducted in association with ARDA is of special significance to the Atlantic region where farm size is relatively small. This program which provides for the leasing, improvement and subsequent purchase of land by operators who wish to expand their farming operations is in effect an extension of current federal and provincial farm credit policies and is generally operated by or in conjunction with provincial farm credit agencies. The normal procedure is for farmers to make application and submit an owner's offer of sale for the property they wish to acquire under the program. If approved, the property is purchased by the provincial agency and leased to the farmer.

The program was put in operation during the 1965-66 fiscal year. During 1967 and 1968 a total of 119 farms or properties containing 12,973 acres of land were acquired in New Brunswick at a purchase price of \$616,114. In Prince Edward Island, 28 properties consisting of 2,792 acres of land were purchased at a cost of \$176,550. In Nova Scotia during this same period, 427 farms containing 49,899 acres were purchased at a cost of \$1,767,117. By March 1969, the Nova Scotia program involved the purchase and lease of 565 properties, a total of 26,450 cultivated acres at a cost of \$2,078,000. These expenditures did not include legal or other charges associated with the purchase of the property nor did they include the cost of subsequent improvement to the land which in Nova Scotia and New Brunswick may involve additional expenditures of up to \$50 per acre.

This has been a very popular program with farmers because leasing permits increasing acreage without tying up additional capital in land. The increased size of farm has been accompanied by increased output. Many of the properties acquired were not being operated intensively and the allowance

of up to \$50 per acre for improvements plus new and more active management has resulted in increased production on this land. Data secured from a sample group of 93 farmers in Nova Scotia taking part in this program indicated they had increased cultivated land by an average of 72 acres per farm. Following acquisition of the land, 66 of these farms also made additional capital purchases of buildings, machinery and livestock.

The program has been confined to privately owned land. In some cases, acquisition of adjoining Crown land might be the preferred method of farm enlargement and a more flexible land use program is

needed to facilitate such arrangements. Farmers wishing to acquire Crown lands would probably be located in outlying areas. A comprehensive land use program would also give consideration to social costs since benefits arising from increased farm size or settlement might be more than offset by added costs of maintaining roads, schools and other facilities.

REFERENCE

- (1) *Revised Statutes of Nova Scotia*, 1967, Chapter 163—Part I.

PUBLICATIONS

ECONOMICS BRANCH PUBLICATIONS

Seeding Prairie Rangelands, a Management and Economic Guide, J. K. Wiens, R. W. Lodge and A. Johnston, Economics Branch and Research Branch, Canada Department of Agriculture, Ottawa, September 1969, Pub. No. 69/13. pp. 25.

Recommendations are presented to guide farmers in the Prairies in seeding ranges to improved forage species. Both the physical and economic factors to be considered are explained.

Costs and Returns, Commercial Wheat Farms, Prairie Provinces, 1968, B. Middlemiss and M. Ragush, Economics Branch, Canada Department of Agriculture, Regina, August 1969, Pub. No. 69/12. pp. 82.

Various aspects of the production of wheat in the Prairie Provinces are described. Included are data on land use, capital investment and production practices, and summaries of income and expenses.

Costs and Returns, Wheat and Grain-Beef Cattle Farms, Prairie Provinces, Parkbelt, 1968, B. Middlemiss and M. Ragush, Economics Branch, Canada Department of Agriculture, Regina, October 1969, Pub. No. 69/15. pp. 93.

Data from typical wheat farms and grain-beef cattle farms of the Black Soil Zone of the Prairie Provinces are presented in this report. Information is given on size of farm, production, management practices and farm costs and returns.

UNITED NATIONS PUBLICATIONS

Available from the Queen's Printer, Ottawa

Provisional Indicative World Plan for Agricultural Development, Food and Agriculture Organization of the United Nations, August 1969. 3 Volumes.

A synthesis and analysis of factors relevant to world, regional and national agricultural develop-

ment. Current policies and programs of member countries are discussed and projections are made to 1985.

OTHER PUBLICATIONS

Not available from the Economics Branch

Price Performance of the Ontario Fresh Fruit Marketing Board, Sheridan Campbell and Roslyn Giblon, Farm Economics, Co-operatives and Statistics Branch, Ontario Department of Agriculture and Food, Toronto, 1969. pp. 38.

The report of a study investigating the impact on prices of a new marketing system for the fresh sale of pears, plums and grapes.

A Method for Predicting Ontario Hog Supplies, Roslyn E. Giblon, Farm Economics, Co-operatives and Statistics Branch, Ontario Department of Agriculture and Food, Toronto, 1969. pp. 31.

This publication contains an analysis of some of the factors affecting hog production. The author examines the influences of the number of hogs on farms, hog prices, beef prices, corn prices and total United States feed production, on the supply of hogs.

Agriculture, Fisheries, Forestry and Nutrition in Canada, 1967-68 and 1968-69, Progress and Program Report to the Food and Agriculture Organization of the United Nations; prepared by the Canadian Inter-departmental FAO Committee, Ottawa, September 1969. pp. iii + 41. Available from the International Liaison Service, Canada Department of Agriculture, Ottawa.

This report deals with the progress made in the past two years in the improvement of production and distribution; the raising of the levels of nutrition and living standards; the settlement of the rural population; and, in planning for agricultural development. The main problems still to be solved are also discussed.

VOLUME 4 NUMBER 6

FEBRUARY 1970

CANADIAN FARM ECONOMICS

- Canada and the World Food Program. *Frank Shefrin* 1
- Rapeseed Production.....
J. S. Carmichael and S. W. Garland 11
- Flaxseed Production.....
J. S. Carmichael and S. W. Garland 18
- Resource Use Efficiency as Related to Farm Business
Size in the Red Deer Area of Alberta.....
L. M. L. Rokosh, T. H. Lovering and J. E. Elsom 24
- Policy and Program Developments..... 23
- Publications..... 10
- Consolidated Index, Volume 4..... 31

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CANADIAN FARM ECONOMICS

CANADA AND THE WORLD FOOD PROGRAM

Frank Shefrin¹

In the State of Bahia, *Brazil*, the World Food Program (WFP) is shipping nearly \$2.4 million worth of food aid over a three-year period to provide snacks and meals to pupils in some 29 secondary schools with a total enrolment of more than 62,000 children. The students mainly come from low-income groups and their normal diet is lacking in proteins and calories. The aim of the project is to assist the educational authorities in their plans to make secondary education more widely available and to broaden the curriculum to include subjects directly related to the economic development of the country, such as training in industrial, commercial and agricultural activities.

In the last 20 years, the capital of *Chad*, Fort-Lamy, has increased its population by 65 per cent, and since the main source of fuel is wood and charcoal, other types of fuel being prohibitively expensive, the result has been the wholesale destruction of woody vegetation around the city so that fuelwood is becoming scarce and erosion already evident. The situation will become critical within the next 10 years unless steps are taken to renovate the forest. The Government has decided to undertake a reforestation program which will cover 12,000 hectares after 12 years, but will start on a modest scale in 1970 with 20 hectares and employ 25 workers. By 1973 more than 700 workers will be working on 1,000 hectares. The World Food Program is contributing more than \$500,000 worth of commodities over a five-year period to enable the Government to pay part of the workers' wages in kind. The regular rations of sorghum, dried skim milk, edible oil, dried fish, and sugar will also help the undernourished, formerly unemployed, workers to sustain the necessary physical effort and they will also receive food for their dependents.

The largest WFP project ever approved for any country will provide nearly \$56 million worth of dried skim milk and butter oil over a five-year period to expand *India's* milk industry. Since there is a large proportion of vegetarians among the population, milk is by far the most important source of animal protein in the Indian diet. However, the milk industry needs to be expanded and modernized if it is to supply the country's needs. At present the market is still dominated by private traders who retail, at a high price, a product of poor hygienic quality, often adulterated or diluted. The producers are small mixed farmers who own two or three buffaloes and cannot afford to improve their animals or their methods since they lack market facilities and do not make an adequate profit. City milk schemes still serve only a small part of the total urban market.

WFP supplies will be used in four dairy schemes serving Bombay, Calcutta, Delhi and Madras. During the five-year period, 12.6 million tons of dried skim milk and 4.2 million tons of butter oil will be reconstituted to supply wholesome liquid milk at reasonable prices to these towns. The project aims at the setting up of a modern dairy system which should stimulate greater production in rural areas by ensuring farmers a regular and stable market. It will also lead to the removal of cattle from the cities where they represent a growing menace to public health and where rational animal husbandry practices cannot be introduced. Funds accruing from the sale of the milk will be used in other vast schemes for the improvement of animal husbandry, fodder production and improvement of milk collection and transport facilities.

Refugees from Mozambique continue to pour into *Tanzania* and the Government does not have the means to provide for them. The Government has settled about 4,000 refugees at a site called Mputa, with assistance from the United Nations High Commissioner for Refugees and grants of food from

(1) Director, International Liaison Service, Canada Department of Agriculture, and Chairman, Canadian Interdepartmental World Food Program Committee.

WFP. To provide for another 3,000 refugees who will be settled at Kilimarondo, WFP is shipping six months of emergency supplies in the form of maize, dried skim milk, fish and edible oil at a total cost to the Program of \$67,000. This is in addition to the \$89,000 worth of WFP emergency aid granted in May 1969.

Exceptionally violent rain — in some areas a normal year's rainfall fell in one week — caused floods and devastation over large areas of central and southern *Tunisia* in early October 1969. Crops, animals and houses were swept away and hundreds of people were killed. Many thousands lost their homes and all their possessions. A World Food Program emergency allocation of \$1.9 million worth of supplies has been approved by the Director-General of the Food and Agriculture Organization to help feed 100,000 people for 6 months. Nearly 9,600 tons of wheat and 540 tons each of milk powder and edible oil will be made available.

WFP is aiding a project in *Algeria* to plant 10 million trees a year to check soil erosion and the encroachment of the desert; to bring barren land into cultivation by digging new wells and irrigation networks; and to develop agriculture by introducing modern techniques, new strains of crops and livestock and encouraging fruit farming and market gardening. Since November 1965, WFP aid worth more than US\$30 million has been providing rations for 31,250 project workers and their families, and will continue until 1973.

There are seven WFP-aided industrial and mining projects in *Turkey*, costing the Program a total of about US\$5,370,000. Among them are the Zonguldak Coal Basin on the Black Sea coast which supplies more than half of Turkey's national coal production and the Karabuk iron and steel works, the first and largest in the country. There is also the cement industry, with the Program assisting the expansion, modernization or construction of eight plants; nitrogen fertilizer production at Kutahya; the expansion of a pulp and paper factory at Izmit; and the development of lignite mines in two separate districts. Finally, there is a project for prospecting and exploring mineral wealth at 25 camps throughout the country. Broadly speaking, the emphasis is on expansion and modernization. The Program's food has been intended to increase the workers' productivity, not only by feeding them better but also by helping to finance better living and working conditions and training facilities. In some projects, food is used to attract workers to areas where labor is scarce. The results are visible. Managements, for example, have been able to use the savings they make from WFP's additional food supplies to provide

amenities such as larger living quarters, transportation, shower and dressing rooms, recreational facilities and improved kitchens and canteens. Productivity has increased along with better health. Recruitment of workers in remote areas has gone up, while absenteeism has declined. The workers' families have also been fed.

FOOD AID AND DEVELOPMENT

Food aid to meet emergency food shortages due to crop failure, weather, or man-made ravages such as wars is not a new concept. What is new is the utilization of food aid to assist in economic and social development. The above are only a few examples of WFP activities. Since the mid-fifties, the United States, Canada and, to a lesser degree, Australia have, on a government-to-government basis, given food aid to needy countries: the counterpart funds derived from local sales of the food were to be used by recipient governments to assist domestic development programs. Since 1963, food aid has been made available on a multilateral basis by the World Food Program to assist specific economic and social development projects as well as to provide food to meet emergencies. The significant feature in the development of the WFP was the emphasis on project-oriented aid.

THE WORLD FOOD PROGRAM

In 1961, the United Nations General Assembly and the Food and Agriculture Organization Conference approved the establishment of a joint UN/FAO three-year experimental World Food Program with an objective of US\$100 million in contributions, of which US\$95 million was subsequently received. In 1965, this multilateral Program was extended indefinitely, with a target for the following 3 years of US\$275 million, of which US\$188 million was obtained. Subsequent pledging periods were reduced to 2 years and the target for 1969-70 was established at US\$200 million, a figure which was exceeded by \$55 million because of the pledge by the EEC and the supplementary pledge by Canada. The target for 1971 and 1972 is US\$300 million.

The WFP is an international agency, jointly controlled by the UN and FAO, which uses the voluntary grants of foodstuffs and cash that it receives from member countries for economic and social development projects. The food is used in feeding programs to increase nutritional levels, as part payment of wages or as an incentive for voluntary self-help in the construction of capital works, and as an

inducement to land settlement and development. A portion of the Program's resources is also allocated to disaster relief. The cash and service contributions, generally in the area of 25 to 30 per cent are used to pay shipping and administrative costs.

Although the greater part of the Program's resources come from about 10 countries, notably the United States and Canada, there are more than 90 donor countries. Many countries receiving aid have also made token contributions in commodities and/or cash. During the period 1963-70, resources contributed totaled close to \$600 million. Canada has been the second largest contributor to the WFP. For the 1969-70 period, among the almost 100 countries contributing to WFP, the major donors are the United States, \$100 million; Canada, \$32.5 million; Netherlands, \$11 million; Denmark, \$9 million; Sweden, \$8 million; Germany, \$6 million; Norway, \$4.5 million; U.K., \$3 million; France, \$2 million and the EEC, \$69 million (butter oil 35,000 metric tons, and dried skim milk 120,000 metric tons).

The principal areas in which WFP food assistance has been made available may be classified as follows:

Economic and social development projects:

Human resources (feeding programmes)

Secondary and technical schools; training centres

Educational institutions — colleges, universities
Pre-school and primary school children; expectant and nursing mothers

Economic infrastructure

Housing, water supplies and other amenities

Roads, railways — construction, repair, maintenance

Agriculture

Land settlement, reclamation

Soil improvement and conservation

Irrigation structure, dams, flood control

Forest management, afforestation and reforestation

Livestock feeding, rangeland management

Price stabilization — buffer stocks, food reserves

Industry and mineral resources

Production expansion, plant modernization

Mineral prospecting and exploration

Emergency feeding: following natural or man-made disasters,

Hurricanes, typhoons, earthquakes, volcanic eruptions

Prolonged drought — people, livestock

Unexpected influx of refugees

Not more than 10 per cent of the resources of the Program are ordinarily granted to one country during a pledging period. Special attention is given in

all cases to ensuring that there will be no adverse effects on the commercial market.

Commodities are delivered free of charge to the point of entry to the recipient Government, which is then responsible for:

(a) costs directly relating to the WFP commodities; unloading operations at point of entry; internal transportation, storage, distribution; packaging (or repackaging), preservation, conditioning; and,

(b) costs relating to operation of the Government's project: administration, technical supervision and management; any supplementary food required to ensure adequate diets; other commodities, equipment, facilities.

Some of the procedure, outlined by the WFP for recipient countries to apply for food aid for development or emergency purposes, are as follows:

(1) A Government's request for a grant of food aid to assist a project is prepared in accordance with a detailed form provided by WFP through the resident representative of United Nations Development Program.

(2) A request for WFP assistance can be submitted at any time and requires the following information respecting the project for which the assistance is needed:

(a) economic and social objectives;

(b) background and geographical location;

(c) kinds and amount of work to be performed;

(d) proposed operational procedures and related data;

(e) categories and estimated numbers of beneficiaries;

(f) amounts and types of food or feed aid required;

(g) logistics — ports, unloading, storage, transportation;

(h) provision of supplementary foods and supplies;

(i) arrangements for administration and supervision;

(j) estimated costs to the Government.

(3) Approval of a request is subject to completion of an agreement by WFP and the Government, which is usually negotiated by the resident representative. If the project is valued at more than \$750,000 in food and feed, the Intergovernmental Committee, which is the executive committee made up of governmental representatives, must make the final decision.

(4) Implementation of that agreement by WFP is initiated when it receives a "letter of readiness" from the Government certifying that all the necessary preparations have been made for receiving the food commodities and commencing operations.

Procedures for obtaining emergency aid are simpler.

More than 300 projects in 78 countries have been approved since the Program began operations, at a total cost to WFP of US\$800 million. Classified by regions there were: in Latin America and the Caribbean, 48 projects in 18 countries; in North Africa and the Near East, 73 projects in 11 countries; in West Africa, 55 projects in 21 countries; in Mediterranean Europe and East Africa, 42 projects in 13 countries; in Asia and the Far East, 90 projects in 15 countries. In addition, 96 emergency operations have been undertaken in 61 countries at a total cost to the Program of US\$72 million.

The commodity basket consists mainly of cereals (wheat, maize, sorghum, barley, rice, oats), about 55 per cent of the total. Dairy products (dried skim milk, cheese, butter oil, dried whole milk, butter and condensed milk) made up 26 per cent of the food basket. The balance includes such foodstuffs as fish, vegetable oil, dried eggs, meat, pulses, fruit, sugar and syrup, tea and coffee.

CANADA AND THE WORLD FOOD PROGRAM

Canada was one of the countries that took a major initiative in setting up the WFP. At the FAO Conference in November 1961, the Canadian Delegation led by the Minister of Agriculture took the lead in sponsoring and securing unanimous acceptance of a Resolution approving the establishment of a joint UN/FAO three-year experimental World Food Program (WFP) with an objective of \$100 million in contributions. Immediately afterwards, the Canadian Delegation to the UN General Assembly co-sponsored a complementary Resolution.

Although Canadian pledges have increased at each pledging Conference convened by the UN and FAO, Canada has twice made a supplementary pledge. The first target for the years 1963-65 was US\$100 million: Canada pledged US\$5 million of which one-third was

in cash. Late in 1964, Canada made a supplementary pledge of almost US\$2 million. The second target, for 1966-68, was US\$275 million and Canada pledged US\$27.5 million of which 25 per cent was in cash. The third target, for 1969-70, a two-year period, was US\$200 million, and Canada pledged \$20 million of which 25 per cent was in cash. In August 1969, Canada made a supplementary pledge of US\$10 million in wheat and wheat flour and \$2.5 million in cash. The Canadian pledge for the 1971-72 period was \$30 million of which 78 per cent is in commodities, and the balance in cash. Canada continues to be the second largest individual contributor to the WFP.

It should be noted that Canada's contribution to the World Food Program represents only a part of the Canadian food aid program. The larger part of Canadian food aid is shipped bilaterally, agreed to on a government-to-government basis.

Shipments under the WFP pledge are made when called and are subject to WFP instructions as to recipient country, kind, quality, packaging and shipping. The commodities made available are designated by the Canadian government.

Canadian food distributed by the WFP is usually part of an international food basket. In order to obtain as balanced a food basket as possible for any given project, WFP will ship food from several donors to one recipient. However, Canadian food aid retains its identity as the food packages are marked "Gift of Canada".

The kind, volume, and value of food aid moved out of Canada under instructions from the WFP between January 1, 1963 and December 31, 1969 is shown in Table 2. The countries to which Canadian food aid was shipped by the WFP and the projects in which this food was utilized are shown in Tables 3 to 8. These data reveal the breadth of Canadian participation, both in terms of countries aided and projects. It should be noted that in all instances the Canadian contribution constitutes only part of the value of food aid made available to a country for the

TABLE 1—CANADIAN CONTRIBUTIONS^a TO WFP, 1963 TO 1970

Year	Commodities	Cash	Total
United States dollars			
1963-1965.....	3,851,006	1,680,000	5,531,006
1966-1968.....	21,550,925	6,875,000	28,425,925
1969-1970.....	25,000,000	7,500,000	32,500,000
1971-1972.....	23,400,000	6,600,000	30,000,000 ^b
Total.....	73,801,931	22,655,000	96,456,931

^a These figures are based on actual shipments rather than pledges. The total shown for 1969-1970 is the actual pledge.

^b This total includes the original pledge of \$20 million plus a supplementary contribution of \$12.5 million.

particular project listed. The values shown in Tables 4 to 8 cover only the food shipped by Canada under its contribution to WFP.

These projects may be classified into four main groups: (1) agriculture, (2) human resources, (3) infrastructure, and (4) industry and mineral resources. Canada has, up to date, participated in 138 WFP projects.

Agriculture—Among the variety of agricultural projects there are: (a) resettlement of groups or communities, (b) reclaiming and generally improving land, (c) forestry development, (d) livestock development and (e) commodity price stabilization. Canada has participated in more agricultural projects than any other type—54 (Table 4).

Human Resources—These projects are concerned with what might be described as the development of human resources. Mainly, these are projects for supplying food to educational institutions. Canada has participated in 47 such projects (Table 5).

Infrastructure—The exact scope of the economic

meaning of the word infrastructure is sometimes in question, but here it refers primarily to community development (work on housing, water supplies and a wide range of other communal amenities), the construction of roads and the repairs and maintenance of railways. Canada has contributed to 30 infrastructure projects (Table 6).

Industry and Mineral Resources—These projects are concerned with the development of industry and mineral resources. Canada has contributed to 7 of these (Table 7).

Emergencies, natural or man-made, have been basically of two kinds—sudden, unforeseeable catastrophes such as hurricanes, typhoons, earthquakes and unexpected influxes of refugees; and the more slowly punishing havoc of a prolonged drought or military action. Canada has shipped to 34 emergency projects (Table 8).

Canada, from the very beginning, has been elected to the governing body of the WFP—the Intergovernmental (continued on page 10)

TABLE 2—CANADIAN COMMODITY CONTRIBUTIONS TO WFP, 1963 TO 1969

	Quantity	Value	Percentage of total
	metric ton	dollars	
Dairy products			
Skim milk powder.....	11,514.5	3,447,817	
Whole milk powder.....	1,044	1,007,533	
Butter.....	35	50,511	
Butter oil.....	570	369,630	
Cheese.....	4,954.5	5,401,002	
Evaporated milk.....	1,526.5	478,657	
Total.....		10,755,150	27.0
Egg powder.....	315	810,211	2.0
Grains			
Wheat.....	218,608	15,489,180	
Flour.....	73,855	8,369,362	
Oats.....	16,688	1,101,427	62.8
Total.....		24,959,969	
Pulses			
Beans and peas.....	8,371	1,788,780	4.5
Fish			
Dried and canned fish.....	2,903.4	1,481,675	3.7
Grand total.....		39,795,785	100.0

TABLE 3—CANADIAN PARTICIPATION IN WFP PROJECTS BY REGION AND PROJECT TYPE, 1963 TO 1970

Region	Project Type					Total
	Agriculture	Human Resources	Infrastructure	Industry and Minerals	Emergency	
Latin America and the Caribbean.....	13	12	7	0	4	36
Europe, North Africa and the Near East	25	19	18	7	16	85
Africa.....	7	7	3	0	5	22
Asia.....	9	9	2	0	9	29
World.....	54	47	30	7	34	172

TABLE 4—CANADIAN PARTICIPATION IN WFP AGRICULTURAL PROJECTS

Project Number	Project Description	Commodities Supplied	Value	Time Period
			dollars	
337	Reforestation and rural development in <i>Algeria</i>	Wheat, skim milk, cheese	4,342,265	1966-67 to 1969-70
28	Land settlement in four areas of <i>Bolivia</i>	Dry whole milk, skim milk, cheese	773,798	1964-65 to 1969-70
249	Refugee settlement in <i>Burundi</i>	Skim milk	4,906	1966-67
22	Minor irrigation works in <i>Ceylon</i>	Skim milk, flour	66,050	1964-65
138	Land development in north-east <i>Colombia</i>	Skim milk, cheese, flour	44,770	1967-68 to 1969-70
498	Reforestation in <i>Colombia</i>	Dried fish	4,000	1969-70
213	Agrarian reform and colonization in <i>Ecuador</i>	Canned fish	10,760	1965-66
247	Afforestation in <i>Ecuador</i>	Canned fish, peas	25,797	1968-69 to 1969-70
244	Price stabilization for wheat in <i>Ethiopia</i>	Wheat	333,435	1965-66
47	Land settlement in four areas of <i>Guyana</i>	Skim milk, whole milk, flour, cheese, canned fish	68,749	1964-65 to 1968-69
192	Control of beetle pest in pine forests of <i>Honduras</i>	Skim milk, butter, flour	54,773	1964-65
348	Improvement of milk supply through toning of milk in <i>India</i>	Skim milk	297,369	1968-69
345	Afforestation and forest improvement in <i>Iraq</i>	Skim milk, soft wheat	63,974	1967-68 to 1969-70
442	Improvement of irrigation schemes in <i>Iraq</i>	Flour, condensed milk, skim milk, cheese, pulses	172,176	1968-69 to 1969-70
96	Watershed management of Cane River in <i>Jamaica</i>	Cheese, canned fish, dried fish, peas	83,393	1964-65 to 1969-70
97	Land settlement project in <i>Jamaica</i>	Cheese, canned fish, dried fish, peas	53,309	1965-66
300	Planting village woodlots in <i>Jordan</i>	Cheese, flour	55,996	1966-67 to 1969-70
183	Soil conservation and tree planting in <i>Jordan</i>	Flour, beans	186,946	1966-67 to 1967-68
509	Soil conservation in <i>Jordan</i>	Peas	5,590	1969-70
212	Tidal land reclamation in <i>South Korea</i>	Wheat, flour	272,653	1965-66 to 1968-69
76	Land reclamation and afforestation in <i>Lebanon</i>	Wheat	4,282	1967-68
438	Improvement of orchards in <i>Lebanon</i>	Cheese	13,200	1969-70
87	Land settlement and training in irrigated cultivation in <i>Madagascar</i>	Dried fish	7,000	1969-70
220	Multi-purpose rural development plan in <i>Mali</i>	Dried fish	4,500	1969-70
434	Land settlement in seven areas of <i>Paraguay</i>	Skim milk, wheat, flour	12,737	1968-69
382	Crop diversification program in <i>Paraguay</i>	Cheese, dried fish	10,620	1969-70
182	Squatter resettlement in the <i>Philippines</i>	Beans	2,676	1967-68
297	Watershed management in the <i>Philippines</i>	Flour, beans	18,139	1967-68 to 1969-70
158	Increase in agricultural productivity in the <i>Philippines</i>	Canned fish	14,025	1969-70
1	Resettlement of farmers in the <i>Sudan</i>	Skim milk, whole milk powder	158,181	1967-68
336	Resettlement of nomads in the <i>Sudan</i>	Skim milk, wheat	283,844	1967-68 to 1968-69
413	Afforestation and development of forest products in the <i>Sudan</i>	Wheat	24,855	1969-70
465	Resettlement program in the <i>Sudan</i>	Skim milk, wheat, dried fish	290,142	1969-70
500	Livestock feeding and agricultural diversification in <i>Surinam</i>	Cheese, dried fish	3,531	1969-70
268	Afforestation and construction of forest roads in <i>Syria</i>	Skim milk, cheese, wheat	205,380	1967-68 to 1968-69
002	Stabilization and development of nomadic sheep husbandry in <i>Syria</i>	Oats	50,432	1969-70
272	Integration of livestock into farming system in <i>Syria</i>	Oats	75,648	1969-70
269	Construction of small dams in <i>Syria</i>	Cheese	49,200	1967-68
104	Land reclamation in <i>Taiwan</i>	Butter oil, wheat	163,280	1964-65 to 1965-66
331	Land reclamation in <i>Taiwan</i>	Wheat	97,219	1967-68
198	Reforestation in <i>Taiwan</i>	Wheat	996,251	1968-69
09	Five land settlement schemes in <i>Tanzania</i>	Skim milk	40,692	1966-67
150	Four land settlement schemes in <i>Tanzania</i>	Skim milk	25,830	1966-67
425	Construction of small dams for cactus production in <i>Tunisia</i>	Beans	18,663	1968-69
482	Improve utilization of natural resources and labour in <i>Tunisia</i>	Beans	76,440	1969-70
84	Resettlement project in <i>Turkey</i>	Butter oil	18,208	1966-67
99	Watershed management in <i>Turkey</i>	Oats	90,890	1964-65 to 1968-69
101	Afforestation project in <i>Turkey</i>	Butter oil	33,600	1965-66
175	Flood prevention in Havian Valley in <i>Turkey</i>	Cheese	10,015	1965-66
17	Normal resettlement and livestock improvement in the <i>United Arab Republic</i>	Oats	326,801	1968-69
332	Irrigation project in the <i>United Arab Republic</i>	Flour	1,159,591	1968-69
243	Construction of small dams and wells in <i>Upper Volta</i>	Evaporated and condensed milk	19,665	1968-69 to 1969-70
361	Rehabilitation of the banana industry in <i>West Samoa</i>	Flour	12,194	1968-69 to 1969-70
342	Promotion of milk production in <i>Zambia</i>	Skim milk	18,000	1969-70

TABLE 5—CANADIAN PARTICIPATION IN WFP HUMAN RESOURCES PROJECTS

Project Number	Project Description	Commodities Supplied	Value	Time Period
			dollars	
109	Boarding school pupil feeding in <i>Afghanistan</i>	Cheese	22,289	1969-70
496	Food assistance to university in <i>Afghanistan</i>	Cheese, wheat	13,762	1969-70
224	Education and training of war orphans in <i>Algeria</i>	Evaporated milk, skim milk, cheese, flour, canned fish	222,109	1965-66 to 1969-70
372	Assistance to teacher's college in <i>Algeria</i>	Beans, peas	6,673	1868-69
409	Assistance to primary schools in <i>Algeria</i>	Flour, peas, skim milk, cheese, egg powder, beans	2,062,787	1967-68 to 1969-70
284	School lunch program in <i>Barbados</i>	Cheese, dried fish	52,447	1967-68 to 1969-70
65	Food assistance to rural teacher's colleges in <i>Bolivia</i>	Whole milk powder, cheese, dried fish	76,613	1963-64 to 1969-70
12	School feeding in <i>Brazil</i>	Skim milk, flour	130,374	1965-66 to 1967-68
339	School feeding in <i>Brazil</i>	Dried fish, cheese	604,389	1967-68 to 1969-70
286	Training of unemployed youth for rural settlement in <i>Central African Republic</i>	Cheese, canned fish	4,000	1969-70
174	Food assistance to National Volunteer Service in <i>Ceylon</i>	Flour, canned fish	319,315	1965-66 to 1968-69
291	Food assistance for unemployed youth settlement in <i>Ceylon</i>	Cheese, flour	32,288	1968-69 to 1969-70
430	Food assistance to Agricultural Development Corps in <i>Ceylon</i>	Skim milk, cheese, flour	130,188	1968-69 to 1969-70
202	Improvement in nutrition in schools in <i>Jordan</i>	Peas	2,718	1968-69
230	Pre-school and school feeding in <i>Lesotho</i>	Peas, egg powder	210,224	1965-66 to 1969-70
439	School feeding in secondary, senior high, vocational and teacher's training centres in <i>Liberia</i>	Peas	1,458	1969-70
488	Feeding students, agricultural data collectors and forestry workers in <i>Liberia</i>	Peas	959	1969-70
491	Incentive for workers to participate in courses to raise level of literacy in <i>Liberia</i>	Flour, dried fish	54,971	1969-70
221	Assistance to literacy campaign in <i>Mali</i>	Skim milk	50,591	1965-66
55	School feeding in <i>Mauritania</i>	Wheat	21,737	1969-70
307	Program of complementary pre-school feeding at health centres in <i>Mexico</i>	Skim milk	94,000	1969-70
124	School feeding in <i>Morocco</i>	Dried fish, cheese, flour	261,559	1966-67 to 1969-70
254	University student feeding in <i>Philippines</i> (Mindanao State)	Beans	1,377	1967-68 to 1969-70
432	University student feeding in <i>Philippines</i> (Central Luzon State)	Beans, cheese	4,184	1969-70
421	Feeding in higher educational institutions in <i>Sierra Leone</i>	Beans	1,561	1969-70
229	Vocational training feeding in <i>Syria</i>	Skim milk, cheese, wheat	62,603	1967-68 to 1968-69
492	Food aid for youth camps for feeding trainees in community development programs in <i>Trinidad</i>	Peas, dried fish, skim milk	5,791	1969-70
289	Vocational training feeding in <i>Tunisia</i>	Beans	10,500	1967-68
290	Feeding in agriculture training establishments in <i>Tunisia</i>	Beans, peas	7,360	1967-68 to 1969-70
410	Feeding agricultural workers in training camps in <i>Tunisia</i>	Peas	1,500	1969-70
390	Feeding in educational boarding institutions in <i>Turkey</i>	Skim milk, canned cheese	1,052,828	1969-70
380	School feeding and literacy campaign in <i>Yemen</i>	Flour, cheese	54,950	1969-70
501	Assistance to hospitals and training centres for hospital staff in <i>Yemen</i>	Flour	15,290	1969-70
531	Assistance to primary, secondary and vocational schools in the <i>Sudan</i>	Flour	318,340	1969-70
377	Settlement of nomads in Khashin-El-Gira area of the <i>Sudan</i>	Wheat	80,000	1969-70
232	Assistance to vocational training centres in <i>Chile</i>	Cheese	26,995	1967-68 to 1969-70
427 } 447 }	School feeding in <i>China (Taiwan)</i>	Wheat	965,662	1969-70
95	Feeding of pre-school, school children and expectant mothers in <i>Colombia</i>	Skim milk, whole milk powder	110,373	1965-66
311	Feeding in vocational training centres in <i>Colombia</i>	Cheese, dried fish	127,628	1969-70
549	Nutritional education and supplementary feeding in <i>Colombia</i>	Canned fish	33,575	1969-70
190	Training of unemployed youth for rural settlement in the <i>Congo</i>	Canned fish, cheese, skim milk	88,686	1966-67 to 1969-70
464	Feeding assistance to schools and hospitals in <i>Cyprus</i>	Beans, condensed milk, cheese	129,533	1969-70

TABLE 5—CANADIAN PARTICIPATION IN WFP HUMAN RESOURCES PROJECTS (Concluded)

Project Number	Project Description	Commodities Supplied	Value	Time Period
			dollars	
325	School feeding in secondary and vocational schools in <i>Gabon</i>	Evaporated milk, condensed milk, cheese	46,015	1967-68 to 1969-70
151	Feeding scheme in technical schools in <i>Guinea</i>	Skim milk, dried fish, flour	367,538	1967-68 to 1969-70
359	Assistance to agricultural education centres and other social institutions in <i>Iraq</i>	Flour	108,353	1968-69 to 1969-70
178	Training in youth camps and construction of a youth village in <i>Jamaica</i>	Dried fish, cheese	9,420	1967-68 to 1968-69

TABLE 6—CANADIAN PARTICIPATION IN WFP INFRASTRUCTURE PROJECTS

Project Number	Project Description	Commodities Supplied	Value	Time Period
			dollars	
43	Community development in <i>Chile</i>	Whole milk powder, skim milk powder, cheese, flour	69,662	1967-68 to 1969-70
155	Community improvements in <i>Chile</i>	Dried fish	6,000	1969-70
216	Development of amenities through self-help in <i>Colombia</i>	Peas	24,035	1968-69 to 1969-70
200	Rural water supply program in <i>Costa Rica</i>	Cheese	12,939	1965-66 to 1967-68
71	Construction of school facilities in <i>Guyana</i>	Skim milk, butter oil, butter, cheese, dried fish, flour	39,060	1964-65 to 1968-69
433	Development of amenities in <i>Ecuador</i>	Peas	50,000	1969-70
259	Food assistance to laborers working on the Rajaathan Canal Project in <i>India</i>	Beans	63,400	1968-69
32	Rural community development project in <i>Iraq</i>	Butter oil, flour	161,482	1964-65 to 1969-70
452	Reconstruction of Euphrates flood damaged areas in <i>Iraq</i>	Evaporated milk, condensed milk, cheese, beans, flour	444,875	1968-69 to 1969-70
177	Restoration of Hedjaz <i>Jordan</i> Railway	Butter oil, flour, skim milk, cheese, wheat, dried fish	179,241	1964-65 to 1969-70
298	Construction of agricultural roads in <i>Jordan</i>	Cheese	54,037	1967-68 to 1968-69
283	Program of co-operative rural works in <i>Mexico</i>	Skim milk, cheese	589,171	1967-68 to 1968-69
260	Construction of approach roads in <i>Nepal</i>	Butter oil, canned fish	13,973	1965-66 to 1966-67
365	Economic and rural development of the Western Rif Region, <i>Morocco</i>	Flour	10,230	1969-70
535	Land reclamation and resettlement in the <i>United Arab Republic</i>	Flour	1,207,642	1969-70
486	Urban development in <i>Iraq</i>	Flour	220,880	1969-70
206	Construction of roads in <i>Peru</i>	Skim milk, egg powder, dried fish	80,362	1965-66 to 1966-67
125	Expansion of rural employment through land reclamation and irrigation in <i>Senegal</i>	Whole milk powder	50,990	1964-65
180	Restoration of Hedjaz Railway in <i>Syria</i>	Butter oil, flour, canned fish, skim milk, cheese, wheat	156,712	1964-65 to 1967-68
185	Secondary roads construction in <i>Syria</i>	Butter oil, cheese	142,763	1965-66 to 1967-68
184	Self-help housing in <i>Syria</i>	Flour	6,776	1965-66
271	Installation of generators and construction of transmission lines in <i>Syria</i>	Cheese	40,146	1967-68 to 1968-69
273	Improvement of the Aleppo-Akkoni Railway in <i>Syria</i>	Cheese, wheat, skim milk	22,798	1967-68 to 1968-69
402	Rural community development in <i>Togo</i>	Dried beans, dried fish	14,590	1969-70
374	Community development and institutional feeding in <i>Tunisia</i>	Peas	634	1967-68
86	Construction of secondary roads in <i>Turkey</i>	Butter oil, cheese	71,069	1964-65 to 1966-67
320	Village water supply in <i>Turkey</i>	Beans	7,200	1968-69
251	Malaria eradication and trachoma control in <i>Turkey</i>	Cheese	7,655	1965-66
338	Assistance to squatter housing in <i>Turkey</i>	Peas	220,000	1969-70
322	Conversion of basin irrigation in Upper Egypt, <i>United Arab Republic</i>	Skim milk	194,999	1969-70

TABLE 7—CANADIAN PARTICIPATION IN WFP INDUSTRIAL AND MINERAL RESOURCE PROJECTS

Project Number	Project Description	Commodities Supplied	Value	Time Period
			dollars	
140	Development of nitrogen industry in <i>Turkey</i>	Butter oil, beans	13,478	1965-66 to 1966-67
142	Development of the Zonguldak Coal Basin in <i>Turkey</i>	Butter, skim milk, beans	98,223	1965-66 to 1967-68
144	Expansion of the Karabuk Iron and Steel Works in <i>Turkey</i>	Beans	28,159	1966-67 to 1968-69
145	Mineral prospecting and exploration in <i>Turkey</i>	Beans, cheese	37,770	1967-68 to 1969-70
542	Scheme for sawmilling and forestry operations in Bhar-El-Ghazal province of the <i>Sudan</i>	Wheat	36,000	1969-70
451	Integrated plan for the development of the North in <i>Iraq</i>	Flour	249,810	1969-70
31	Urban development in <i>Abril, Iraq</i>	Flour	44,000	1969-70

TABLE 8—CANADIAN PARTICIPATION IN WFP EMERGENCY PROJECTS

Project Number	Project Description	Commodities Supplied	Value	Time Period
			dollars	
851	<i>Afghanistan</i>	Wheat	833,243	1967-68 to 1968-69
	<i>Algeria</i>	Wheat	838,917	1966-67
843	<i>Bolivia</i> , drought, storm	Flour, beans, peas, canned fish, skim milk	396,111	1967-68 to 1968-69
845	<i>Central African Republic</i> , assistance to Sudanese refugees	Skim milk, beans	86,801	1967-68
811	<i>Cuba</i> , hurricane relief	Butter oil	89,905	1964-65
835	<i>Greece</i>	Condensed milk	10,196	1966-67
842	<i>India</i>	Wheat	1,687,870	1966-67
806	<i>Indonesia</i> , volcanic eruption	Dried fish, skim milk	130,105	1963-64
866	<i>Indonesia</i>	Dried fish, flour	197,523	1968-69
869	<i>Indonesia</i>	Wheat	69,008	1968-69
867	<i>Jamaica</i>	Dried fish, skim milk, flour	292,242	1968-69
855	<i>Jordan</i>	Beans, peas, skim milk	201,232	1967-68 to 1968-69
886	<i>Jordan</i>	Skim milk	84,000	1969-70
828	<i>Kenya</i> , famine	Dried fish	99,000	1965-66
863	<i>Lesotho</i>	Peas	65,038	1968-69
847	<i>Mali</i>	Beans	482,037	1967-68
881	<i>Mauritania</i>	Wheat	121,000	1969-70
808	<i>Pakistan</i> , flood	Dried fish	221,330	1963-64
843	<i>Pakistan</i> , drought and cyclone	Wheat	1,231,852	1967-68
851	<i>Pakistan</i>	Wheat	1,386,257	1967-68
841	<i>Senegal</i>	Skim milk, beans	277,500	1966-67
885	<i>Senegal</i>	Skim milk	206,530	1969-70
858	<i>Sudan</i>	Beans	29,280	1967-68
882	<i>Sudan</i>	Wheat, skim milk	162,937	1969-70
852	<i>Syria</i>	Beans	31,831	1967-68
854	<i>Syria</i>	Skim milk, beans, peas, flour	453,934	1967-68 to 1968-69
844	<i>Tanzania</i>	Canned fish, skim milk	39,353	1966-67 to 1967-68
810	<i>Trinidad</i> , hurricane	Whole milk powder, cheese	145,616	1963-64
840	<i>Turkey</i> , earthquake	Wheat, beans	704,935	1966-67
868	<i>Turkey</i>	Wheat, beans	90,092	1968-69
856	<i>United Arab Republic</i>	Skim milk, peas, flour	123,763	1967-68
837	<i>West Samoa</i> , hurricane	Condensed milk	55,500	1965-66
838	<i>Yemen</i> , drought	Skim milk	70,148	1966-67
900	<i>South Yemen</i>	Flour	832,000	1969-70

mental Committee (IGC). The Committee consists of 24 member countries—12 elected by the FAO Council and 12 by the UN Economic and Social Council. The first Chairman of the IGC was a Canadian.

To conclude, WFP experience to date has shown that there are diverse ways in which food aid, while directly combatting malnutrition, can assist economic and social development. These include paying wages, partly in food, to people working on development projects; improving the quality of the labor force through support to trainees at vocational schools or colleges by providing additional food, and through feeding projects to prevent irreparable mental and physical damage to babies and children; easing balance of payment difficulties; and, supporting agricultural price stabilization schemes. Thus, when provided in the form and on terms most appropriate to the needs of people in developing countries—taking into account the patterns of resources scarci-

ties impeding development—food aid can assist in accelerating rates of economic growth.

At the same time it should be recognized that food aid, however large, well organized and useful in meeting economic and humanitarian needs, cannot provide a solution to the underlying food problem of the developing countries. Food shortages are a symptom of the general state of under-development of the countries concerned. As was stressed in the Declaration of the World Food Problem approved by the second United Nations Conference on Trade and Development, the backwardness of the agricultural sector in many developing countries has not only kept food production from rising fast enough to match increases in demand, it has also perpetuated the chronic state of under-employment and low incomes, to the detriment of overall economic development. Efforts to solve the food problem of developing countries must be carried out on a broad front as part of the overall economic development efforts.

PUBLICATIONS

ECONOMICS BRANCH PUBLICATIONS

Organizational Characteristics of Grain-Cattle Farms in the Prairies Provinces, 1956-1965, T. F. Joyce, Economics Branch, Canada Department of Agriculture, Regina, November 1969, Pub. No. 69/17. pp. ii + 47.

This report, one of a series of studies in the Prairies Provinces, gives production and financial data for grain-cattle farms in the various soil zones of the region. Information is given for the 10 years, 1956 to 1965.

Cooperation in Canada, 36th Annual Summary, 1967, J. M. Sullivan, Economics Branch, Canada Department of Agriculture, Ottawa, October 1969, Pub. No. 69/18. pp. 22.

UNITED NATIONS PUBLICATIONS

Available from the Queen's Printer, Ottawa

Agricultural Advisory Services, Development in OECD Member Countries, 1968, Organization for Economic Cooperation and Development, Paris, 1969. pp. 363. Price: US \$7.00.

This publication presents the conclusions and recommendations of the Working Conference of Directors of Advisory Services, held in Paris, September 23 to 27, 1968. The papers presented at this Conference and the report of the Secretariat are included. There is also a description of the organization of agricultural advisory services in 18 OECD member countries.

The State of Food and Agriculture, 1969, Food and Agriculture Organization of the United Nations, Rome, 1969. pp. ix + 196.

This report contains data on world food production by regions, and on international trade in agricultural products. Development plans and assistance programs are also reviewed. Two special features in this report are an examination of agricultural marketing improvement programs in developing countries and an analysis of the role of forest industries in economic development.

OTHER PUBLICATIONS

Not available from the Economics Branch

The Economics of Seasonal Industrial Milk Production in Ontario, H. L. Patterson, Farm Economics, Co-operatives and Statistics Branch, Ontario Department of Agriculture and Food, Toronto, September 1969. pp. iv + 22.

An analysis of the seasonal variation in industrial milk production and the problems associated with this variation for the milk producers and processors. The author suggests some government policies and individual producer actions that would help maintain an even flow of milk production throughout the year.

Trends in the Production and Marketing of Apples in Canada With Special Reference to Ontario, M. Al-Hashimi, Farm Economics, Co-operatives and Statistics Branch, Ontario Department of Agriculture and Food, Toronto, 1969. pp. xi + 57.

This report analyzes the trends in Canadian apple production, consumption and trade in recent years. The domestic market structure for apples is examined in detail.

RAPESEED PRODUCTION

J. S. Carmichael and S. W. Garland

Rapeseed is grown for the oil and the meal produced from the seed. Rapeseed has an oil content of about 40 per cent, compared with sunflowerseed at about 50 per cent and soybeans at about 17 per cent. The main use for the oil is in the manufacture of edible oil foods—margarine, salad and shortening oils. It also has a use as an industrial lubricant. Rapeseed meal is high in protein and is used as a supplement in livestock feeds. Livestock feeders and feed manufacturers have had a long-time prejudice against rapeseed meal but this is gradually being overcome as the quality of the meal is continually being improved.

Rapeseed (in terms of oils and fats equivalent) ranked sixth in world production among edible oils of vegetable or palm origin in 1969. World production of rapeseed oil was estimated at 1.8 million short tons, compared with 5.8 million tons from soybeans and 3.9 million tons from sunflowerseed. Other edible oils produced in quantities larger than that of rapeseed were peanut, cottonseed and coconut. Palm oil production has been increasing and in 1969 was almost as large as that of rapeseed oil. World production of rapeseed increased from 157 million bushels in 1964 to 234 million bushels in 1968. Production of rapeseed in 1969 is estimated at 228 million bushels and of this quantity, Canada produced about 16 per cent. India and China are the main producers of rapeseed (Table 1). Production of

rapeseed in Poland, Canada and France has been increasing more or less steadily.

RAPESEED PRODUCTION IN CANADA

Rapeseed was introduced to Canada in the early 1940's as a war-time measure, mainly to provide a lubricating oil of vegetable origin. It remained a relatively unimportant crop until after the mid-1950's—a period when wheat was in surplus, wheat delivery quotas were restrictive, and farmers were seeking an alternative to wheat. Between 1955 and 1964, rapeseed acreage fluctuated between 138,000 acres and 791,000 acres, the year-to-year changes in acreage being more or less in reaction to changes in prices. Since 1965, rapeseed acreage has increased steadily, from 1.4 million acres to 2 million acres in 1969. Rapeseed is now an important and established crop in Canada. Farm cash receipts from rapeseed in 1969 are estimated at \$59 million.

Rapeseed is grown mainly in the Parkbelt area of the Prairie Provinces. In 1969, some planting was done on summerfallow in the northern part of the Dark Brown Soil Zone. Rapeseed will likely be grown on summerfallow in this zone, particularly on summerfallow on the good clay and clay loam soils, but it is not likely to be grown extensively on the open plains.

TABLE 1—RAPESEED: PRODUCTION BY MAJOR PRODUCING COUNTRIES AND ESTIMATED WORLD TOTAL, AVERAGE 1962-66, ANNUAL 1964 TO 1969

Country	Average 1962-66	1964	1965	1966	1967	1968	1969*
				million bushels			
Canada.....	15.2	13.2	22.6	25.8	24.7	19.4	37.1
France.....	10.6	10.9	14.9	14.0	18.7	19.8	22.0
West Germany.....	4.6	4.8	4.7	4.4	5.5	7.5	7.0
Sweden.....	6.5	8.0	9.5	3.8	9.8	10.5	8.1
East Germany.....	7.8	7.6	9.3	9.2	12.0	12.0	n.a.
Poland.....	15.9	11.8	22.2	19.8	28.7	30.9	n.a.
Mainland China.....	28.0	29.1	30.9	32.4	35.3	34.7	n.a.
India.....	55.5	40.3	64.6	56.3	54.1	65.3	n.a.
Japan.....	6.3	5.9	5.5	4.2	3.5	3.0	n.a.
Pakistan.....	13.8	13.3	13.5	12.3	13.5	17.5	n.a.
World total.....	175.8	157.2	211.3	195.5	221.2	234.5	227.5

n.a. = not available.

* Production figures for 1969 are estimates only where available.

Sources: (1) *World Agricultural Production and Trade*, Foreign Agricultural Service, United States Department of Agriculture, Washington, D.C.

(2) *Field Crop Reporting Series—No. 20*, Cat. No. 22-002, Dominion Bureau of Statistics, Ottawa.

TABLE 2—RAPESEED ACREAGE, BY PROVINCE, CANADA, 1950 TO 1969

Year	Canada	Manitoba		Saskatchewan		Alberta	
	Thousand acres	Thousand acres	Percentage of all Canada	Thousand acres	Percentage of all Canada	Thousand acres	Percentage of all Canada
Average 1950-54.....	19.0	4.0	21.1	15.0	78.9	—	—
Average 1955-59.....	389.4	19.3	5.0	328.0	84.2	42.1	10.8
1960.....	763.0	33.0	4.3	550.0	72.1	180.0	23.6
1961.....	710.3	29.3	4.1	374.0	52.7	307.0	43.2
1962.....	371.2	32.2	8.7	167.0	45.0	172.0	46.3
1963.....	478.0	45.0	9.4	210.0	43.9	223.0	46.7
1964.....	791.0	84.0	10.6	303.0	38.3	404.0	51.1
Average 1960-64.....	622.7	44.7	7.2	320.8	51.5	257.2	41.3
1965.....	1,435.0	145.0	10.1	555.0	38.7	735.0	51.2
1966.....	1,525.0	170.0	11.2	731.0	47.9	624.0	40.9
1967.....	1,620.0	145.0	9.0	600.0	37.0	875.0	54.0
1968.....	1,052.0	91.0	8.6	511.0	48.6	450.0	42.8
1969.....	2,012.0	196.0	9.7	1,000.0	49.7	816.0	40.6
Average 1965-69.....	1,528.8	149.4	9.8	679.4	44.4	700.0	45.8

— = none reported.

Sources: *Handbook of Agricultural Statistics, Part 1—Field Crops*, Cat. No. 21-507; *Quarterly Bulletin of Agricultural Statistics*, Cat. No. 21-003, and *Field Crop Reporting Series*, Cat. No. 22-002, Dominion Bureau of Statistics, Ottawa.

TABLE 3—RAPESEED: YIELD PER ACRE, PRODUCTION, AVERAGE FARM PRICE AND TOTAL FARM VALUE, CANADA, 1950-51 TO 1969-70

Crop Year	Average Yield Per Seeded Acre	Total Production	Average Farm Price Per Bushel	Total Farm Value
	bushels	thousand bushels	dollars	thousand dollars
Average 1950-51 to 1954-55.....	15.5	294	1.72	507
Average 1955-56 to 1959-60.....	14.1	5,508	1.59	8,774
1960-61.....	14.6	11,120	1.65	18,116
1961-62.....	15.8	11,220	1.80	20,179
1962-63.....	15.8	5,860	2.05	11,972
1963-64.....	17.5	8,360	2.52	21,042
1964-65.....	16.7	13,230	2.74	36,309
Average 1960-61 to 1964-65.....	16.0	9,958	2.16	21,524
1965-66.....	15.7	22,600	2.41	54,360
1966-67.....	16.9	25,800	2.47	63,760
1967-68.....	15.2	24,700	1.92	47,506
1968-69.....	18.4	19,400	n.a.	n.a.
1969-70.....	18.4	37,100	n.a.	n.a.
Average 1965-66 to 1969-70.....	17.0	25,920	n.a.	n.a.

n.a. = not available.

Sources: *Handbook of Agricultural Statistics, Part 1—Field Crops*, Cat. No. 21-507, and *Quarterly Bulletin of Agricultural Statistics*, Cat. No. 21-003, Dominion Bureau of Statistics, Ottawa.

Manitoba has not been a producer of large quantities of rapeseed, growing only about 10 per cent of the Canadian crop (Table 2). In Saskatchewan, rapeseed has been firmly established as a crop since 1955. Saskatchewan rapeseed acreage fluctuates from year to year but has exceeded 500,000 acres each year since 1965; in 1969, it was 1 million acres. Rapeseed was first reported in Alberta in 1955 and since 1960 has been firmly established as a crop in that province. The average acreage in Alberta during the past five years exceeded that in Saskatchewan.

The average yield of rapeseed per acre has been increasing slowly (Table 3). In recent years, most rapeseed was seeded on summerfallow and this has given an element of stability to yields. Rapeseed responds well to fertilizer and yields that are considerably higher than the 17-bushel average of recent years can be obtained.

The average yield of rapeseed per acre has been highest in Saskatchewan. Average yields per acre for the 1963-68 period were: 15.2 bushels in Alberta,

TABLE 4—RAPESEED: EXPORTS FROM SPECIFIED COUNTRIES, AVERAGE 1962-66, ANNUAL 1963 TO 1968

	Average 1962-66	1963	1964	1965	1966	1967	1968
million bushels							
Canada.....	8.6	6.2	3.6	10.6	14.0	14.8	14.5
European Economic Community:							
France.....	4.7	3.1	5.3	5.6	5.8	4.6	5.1
Netherlands.....	0.4	0.6	0.5	0.2	0.5	0.3	0.9
Other Countries.....	0.1	—	0.1	0.2	0.1	0.4	0.3
Total EEC.....	5.2	3.7	5.9	6.0	6.4	5.3	6.3
Denmark.....	1.6	1.9	2.1	1.7	1.4	0.9	0.3
East Germany.....	0.1	—	—	—	0.6	0.8	2.4
Sweden.....	1.6	1.4	2.1	3.2	0.8	1.0	2.6
Poland.....	1.5	0.2	—	2.7	3.9	4.7	7.7
Mainland China.....	0.3	—	—	0.2	1.2	0.8	0.4
Other.....	0.3	0.2	0.4	0.2	—	0.2	0.1
Total.....	19.2	13.6	14.1	24.6	28.3	28.5	34.3

— = none reported.

Source: *Foreign Agriculture Circular*, Foreign Agricultural Service, United States Department of Agriculture, Washington, D.C.

TABLE 5—RAPESEED OIL: EXPORTS FROM SPECIFIED COUNTRIES, AVERAGE 1962-66, ANNUAL 1963 TO 1968

Country	Average 1962-66	1963	1964	1965	1966	1967	1968 ^a
metric tons							
Canada.....	111	55	177	2	0	0	0
European Economic Community:							
Belgium-Luxembourg.....	9	17	10	5	11	1,123	1,393
France ^b	19,585	7,006	11,730	32,303	43,719	35,711	28,983
West Germany.....	17,491	13,758	14,293	24,534	25,853	30,848	63,177
Italy.....	8	5	—	1	34	1	605
Netherlands.....	1,407	1,276	378	1,246	2,907	2,901	6,787
Total EEC.....	38,500	22,052	26,411	58,089	72,524	70,584	100,945
Denmark.....	210	487	8	347	199	716	339
Poland.....	6,642	4,296	0	7,825	21,088	65,515	70,000
Sweden.....	14,528	14,946	8,858	16,398	14,015	22,107	25,295
Mainland China.....	7,360	0	1,202	3,764	31,806	17,537	14,427
Japan.....	3,876	2,574	2,355	3,634	10,816	9,500	6,079
Total.....	71,227	44,410	39,011	90,059	150,448	185,959	217,085

^a Preliminary.^b Includes mustard oil.

• Less than 0.5 tons.

Source: *Foreign Agriculture Circular, Fats, Oils and Oilseeds*, Foreign Agricultural Service, United States Department of Agriculture, Washington, D.C., October 1969.

16.1 bushels in Manitoba, and 18.4 bushels in Saskatchewan.

WORLD TRADE IN RAPESEED AND RAPESEED PRODUCTS

World trade in rapeseed has been increasing steadily. World exports were 13.6 million bushels in 1963 and 34.3 million bushels in 1968 (Table 4). Canada, with average exports of 14.4 million bushels during 1966-68, is the world's largest exporter of rapeseed. Other exporters of a considerable quantity in 1968 were France, Poland, East Germany and Sweden. However, of this group of countries only

Poland has consistently increased the quantity of rapeseed exported each year.

World exports of rapeseed oil have increased each year since 1964. The main exporters of rapeseed oil are Poland, West Germany, France, Sweden and Mainland China. All of these countries substantially increased their exports during 1966-68 (Table 5). Canada exported a small quantity of rapeseed oil in the early 1960's but no exports were reported in recent years.

Japan is the main importer of rapeseed, taking more than 11 million bushels in 1968 (Table 6). Other large importers are Italy, West Germany, United Kingdom and Algeria. Japanese imports of rapeseed

TABLE 6—RAPESEED: IMPORTS* INTO SPECIFIED COUNTRIES BY TOTALS AND FROM CANADA, AVERAGE 1962-66, ANNUAL 1964 TO 1968

	Average 1962-66		1964		1965		1966		1967		1968	
	Total Im-ported	From Canada	Total Im-ported	From Canada	Total Im-ported	From Canada	Total Im-ported	From Canada	Total Im-ported	From Canada	Total Im-ported	From Canada
thousand bushels												
United Kingdom...	904	151	514	92	1,440	357	1,890	162	1,794	456	3,544	—
European Economic Community:												
Belgium-Luxembourg	116	—	83	—	178	85	120	n.a.	176	—	136	—
France.....	415	68	336	—	198	—	359	—	217	—	792	—
West Germany...	2,653	477	1,419	9	4,451	906	4,021	868	3,014	90	4,762	10
Italy.....	5,278	1,770	2,706	130	5,833	1,925	8,883	2,412	9,767	3,485	6,606	327
Netherlands.....	399	n.a.	141	n.a.	714	n.a.	350	n.a.	829	699	837	270
Total EEC.....	8,862	3,168	4,686	513	11,374	3,813	13,733	5,215	14,003	4,274	13,133	607
Finland.....	182	18	157	90	162	—	336	—	197	—	432	—
Algeria.....	2,708	209	2,931	—	2,619	—	2,383	—	2,377	—	1,924	—
Morocco.....	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	568	n.a.	550	—
Japan.....	4,527	4,309	3,357	2,500	4,467	4,582	9,324	7,780	9,498	9,382	11,019	11,116
Taiwan.....	n.a.	51	n.a.	168	n.a.	—	—	—	n.a.	638	n.a.	2,092
United States...	253	35	185	125	245	5	123	6	156	10	421	107
Total.....	17,209	8,610 ^b	11,663	3,641	20,086	10,665	27,679	13,958	27,876	15,332	30,104	14,489

n.a. = not available.

— = none reported.

* The estimates of total imports and imports from Canada are not exactly comparable because they were compiled for a different "year".

^b Canadian exports include, in addition, small quantities to Spain, India, Pakistan and South Korea.

Sources: (1) *Foreign Agriculture Circular, Fats, Oils and Oilseeds*, Foreign Agricultural Service, United States Department of Agriculture, Washington, D.C.

(2) *Trade of Canada, Exports by Commodities*, Cat. No. 65-003, Dominion Bureau of Statistics, Ottawa.

TABLE 7—RAPESEED OIL: IMPORTS INTO SPECIFIED COUNTRIES, AVERAGE 1962-66, ANNUAL 1964 TO 1968

	Average 1962-66	1964	1965	1966	1967	1968 ^a
metric tons						
United States.....	2,248	2,618	1,991	3,398	3,894	4,388
European Economic Community:						
Belgium-Luxembourg ^b	785	402	930	1,921	2,062	9,374
France ^c	1,923	1,075	1,292	2,243	1,417	6,741
West Germany.....	8,586	4,700	7,667	22,328	27,493	27,235
Italy.....	963	178	590	1,374	19,801	23,354
Netherlands.....	8,209	4,051	11,182	14,387	9,501	30,238
Total EEC.....	20,466	10,406	21,661	42,253	60,274	96,942
Austria.....	6,424	5,413	8,201	11,957	8,481	12,112
United Kingdom.....	1,265	181	279	38	20	10,828
Czechoslovakia.....	1,907	2,197	2,986	2,500	2,500	2,500
Algeria.....	10,233	6,775	13,659	19,633	6,984	4,940
Morocco.....	2,950	0	0	10,750	0	0
Hong Kong.....	5,437	0	3,708	22,754	20,756	17,744
Total.....	50,930	27,590	52,485	113,283	102,909	149,454

^a Preliminary.

^b Includes sesame oil.

^c Includes mustard oil.

Source: *Foreign Agriculture Circular, Fats, Oils and Oilseeds*, Foreign Agricultural Service, United States Department of Agriculture, Washington, D.C., October 1969.

have been increasing steadily. Imports of other major importing countries were larger in 1968 than in the early 1960's but the year-to-year fluctuations have been considerable.

The main importers of rapeseed oil are West Germany, Italy, Netherlands, Hong Kong and Austria (Table 7). The United Kingdom took 10,828 metric tons of oil in 1968 after being out of the market for a number of years. The United States has been an importer of a small quantity of rapeseed oil each year.

In the early 1960's the main destinations of Canadian rapeseed exports, in order of importance, were Italy, Algeria, France, Japan and the Netherlands. In 1967, the Italian government imposed a tax on rapeseed imports which caused a drop in Canadian sales to Italy in 1968 to less than 10 per cent of the sales in 1967. Canadian rapeseed sales to Japan have increased and in recent years, Canada has had almost all of this market. Rapeseed sales to

the European Economic Community countries have been irregular. Canadian sales to that area were sharply curtailed in 1967 by competition from rapeseed from Poland and sunflowerseed from Russia and Eastern Europe, and by an increase in subsidized rapeseed production in EEC countries.

Various other countries have taken small quantities of Canadian rapeseed during the past decade. Some sales have been made in the United States every year, but an import tariff of 50 cents a bushel limits prospects for increases there. The United Kingdom took a small quantity of Canadian rapeseed for a number of years, but discontinued purchases in late 1967.

The small quantities of rapeseed oil that have been exported from Canada have gone to Australia and a few countries in the Far East. In 1966, a small quantity of rapeseed oil was imported into Canada. There are no reports of rapeseed meal being exported from Canada.

TABLE 8—RAPESEED CRUSHINGS AND PRODUCTION OF OIL AND MEAL, CANADA, 1957-58 TO 1968-69

	Crushings	Oil Produced	Oil Meal Produced
	thousand bushels	million pounds	thousand tons
1957-58.....	465	8.3	7.0
1958-59.....	761	13.8	11.4
1959-60.....	226	4.1	3.3
1960-61.....	960	16.9	14.9
1961-62.....	1,314	24.3	20.2
1962-63.....	1,616	30.8	24.1
1963-64.....	1,574	30.7	23.2
1964-65.....	2,156	42.4	31.5
1965-66.....	3,746	73.4	54.0
1966-67.....	4,963	99.4	70.8
1967-68.....	5,159	163.5	74.2
1968-69.....	6,934	140.5	98.2

Source: *Oils and Fats*, Cat. No. 32-006, Dominion Bureau of Statistics, Ottawa.

TABLE 9—DOMESTIC PRODUCTION OF DEODORIZED OILS, CANADA, TWELVE MONTHS ENDED DECEMBER 1968

	Margarine oil	Shortening oil	Salad oil	Total production of deodorized oil
	thousand pounds			
Vegetable oils.....				
Coconut.....	85	24,482	—	24,567
Corn.....	x	x	x	24,690
Cottonseed.....	x	x	x	7,294
Palm.....	6,937	11,851	27	18,815
Palm kernel.....	—	9,588	—	9,588
Peanut.....	—	x	x	24,763
Rapeseed.....	32,803	46,023	37,867	116,692
Soybean.....	51,209	70,397	24,568	146,174
Sunflowerseed.....	4,721	8,265	35,339	48,325
Other vegetable.....	15	496	654	1,165
Total vegetable oils.....	101,898	197,134	123,041	422,073

— = none reported.

x = some used but quantity not available.

Source: *Oils and Fats*, Cat. No. 32-006, Dominion Bureau of Statistics, Ottawa.

CANADIAN UTILIZATION OF RAPESEED PRODUCTS

The quantity of rapeseed crushed in Canada has been increasing annually (Table 8). Crushings in 1968-69 were almost 7 million bushels, from which were extracted 140.5 million pounds of oil and 98,200 tons of meal. About 25 per cent of the edible oilseeds crushed in 1968-69 was rapeseed, about 39 per cent of all edible oils produced was rapeseed oil and about 17 per cent of the oilseed meal was rapeseed meal.

About 98 per cent of the rapeseed oil produced in Canada is used for food purposes.

About 28 per cent of the deodorized vegetable oil produced in Canada in 1968 was rapeseed oil (Table 9). About 32 per cent of the vegetable oil used for margarine was from rapeseed, 31 per cent of the salad oil, and 23 per cent of the shortening oil.

The quantity of rapeseed meal produced annually in Canada increased from 7,900 tons in 1959 to 98,000 tons in 1968-69.

PRICE TRENDS

World Prices

In 1969, the average prices of most edible fats and oils on world markets were higher than those of 1968 (Table 10). The increase in prices was due to a depletion of inventories in anticipation of lower United States soybean prices because of the reduced support level there, a reduction in deliveries of Russian sunflowerseed oil, and a reduction in world fish oil exports. Prices for most fats and oils on

world markets have been declining for more than a decade and this trend is expected to continue in spite of the increases in 1969. The decline reflects the fact that the per capita availability of edible fats and oils has been increasing steadily at a faster rate than consumption.

Technological developments that have made the various edible oils interchangeable for many uses have influenced the price relationships between the various oils. Historically, sunflowerseed oil commanded the top world price for vegetable oils from the Temperate Zone. In 1967 and 1968, however, the average price for soybean oil was higher than that for sunflowerseed oil. During 1966-68, rapeseed oil prices averaged \$10 to \$20 a ton lower than soybean oil prices, but in December 1969, rapeseed oil prices at Rotterdam were \$28 a ton higher than soybean oil prices.

Prices of rapeseed and rapeseed products on world markets declined after 1966 but there was an upturn in late 1969. Rapeseed prices declined from \$130 a ton in 1966 to \$106 a ton in 1968. In July 1969, the price was \$99 a ton, but by December it had increased to \$128 a ton.

Average prices of \$64 to \$80 a ton for rapeseed meal during the past 3 years, were \$10 to \$20 a ton lower than those for soybean meal. As rapeseed meal becomes more widely accepted as a protein supplement in livestock feeds, prices will probably move closer to those of soybean meal.

Rapeseed oil prices on world markets declined from \$244 a ton in 1966 to \$161 a ton in 1968. Prices increased during 1969 and in December, were \$280 a ton.

TABLE 10—PRICES OF RAPESEED, RAPESEED OIL AND RAPESEED MEAL AND COMPETITIVE PRODUCTS IN WORLD MARKETS, AVERAGE 1963-67, ANNUAL 1965 TO 1968

	1963-67	1965	1966	1967	1968	July 1969	Week of December 18, 1969
United States dollars a metric ton							
Rapeseed							
Canada, CIF United Kingdom.....	124	123	130	122	106	99	128
Soybeans							
United States, CIF Rotterdam.....	115	117	126	112	106	105	103
Rapeseed oil							
ex tank Rotterdam.....	n.a.	n.a.	244	206	161	175	280
Soybean oil							
ex tank Rotterdam.....	236	264	259	216	178	180	252
Sunflowerseed oil							
ex tank Rotterdam.....	251	292	260	212	170	194	285
Rapeseed meal							
34 per cent, f.o.b. ex mill Hamburg.....	n.a.	n.a.	n.a.	78	66	n.a.	79
Soybean meal							
44 per cent, United States, CIF Rotterdam.....	n.a.	n.a.	n.a.	89	89	95	98

n.a. = not available.

Source: Various European sources.

Canadian Rapeseed Prices

The average farm price of rapeseed fluctuates considerably from year to year but only once since 1962-63 has the annual average price been less than \$2 a bushel (Table 3). Canadian rapeseed prices are influenced by the quantity produced domestically and by the prices of competing vegetable oils on world markets. At a farm price of \$2 a bushel, an average rapeseed crop of 18 bushels an acre gives returns comparable with those from cereals for many farmers.

OUTLOOK FOR RAPESEED PRODUCTION IN CANADA

Research on processing techniques and plant breeding have contributed to improvement in the quality of oil and meal produced from rapeseed, with the result that they are now interchangeable with oils and meals from other sources for a wide variety of uses. A better quality oil and a better quality meal from rapeseed, than are now available, are certainties for the near future. The competitive position of Canadian rapeseed oil and meal will then be improved on both the domestic and world markets.

Food products made from soybeans are increasing in popularity. It is expected that part of the meat market will eventually consist of products made from oilseeds. In Canada, this relatively new and growing market could be met by rapeseed products rather than by imported soybean products.

Soybeans from the United States are the main competitors with rapeseed on the Canadian market for oilcake for livestock feeds and for oil for foods. Domestically grown rapeseed should take over a large part of this market in the future.

The most promising export outlet for Canadian rapeseed is Japan. For many years, rapeseed meal was used in Japan for fertilizer. In recent years it has been accepted as a livestock feed. Japan has had an import quota and tariff restrictions on rapeseed but prospects for removal of both appear favorable. Possibilities for exports are considered to exist in various other countries in the Pacific rim, particularly

the Philippines, Malaysia and Hong Kong, and these might involve rapeseed products, particularly oil.

Long-run prospects for exports of rapeseed into Europe are difficult to assess. Poland and other rapeseed producers in Eastern Europe are likely to continue high levels of production and low-pricing policies on export markets. The EEC, Britain and some Mediterranean countries are deficit areas, and there appears to be some market here for Canadian rapeseed if prices are competitive. Within the EEC, policies of high subsidization will likely continue to encourage greater domestic production. Proposals for a tax that would increase butter consumption and decrease margarine consumption, and an international agreement favoring greater use of tropical oils could affect rapeseed utilization in the EEC. A sharp reduction in oilseed crushing facilities in the United Kingdom provides an opportunity to develop an oil market there.

There is a large potential for the production of rapeseed in Canada based on the availability of land and the suitability of climate. It is estimated that 15 million acres in the Prairie Provinces are suitable for growing rapeseed, but not more than half would be seeded to rapeseed in any one year because of the necessity of rotating crops for disease control.

The market for rapeseed in Canada in 1980 is forecast at 15 million bushels, based partly on increased livestock numbers and partly on replacement of imported soybeans. A steady increase in export markets appears possible if rapeseed is produced at prices competitive with those of United States soybeans.

It appears that an acreage that will produce about 40 million bushels of rapeseed in Canada will be adequate for 1970. Prospects are favorable for a steady increase to about 5 million acres a year by the end of the next decade, a production of close to 100 million bushels. The successful development of this potential for rapeseed production in Canada is dependent upon the increase in acreage planted being consistent with the increase in markets, continuing improvement in the quality of rapeseed products, and upon the production of oil and meal at prices competitive with those of other edible oils and protein meals.

FLAXSEED PRODUCTION

J. S. Carmichael and S. W. Garland

Seed flax is grown mainly for the oil (linseed oil) extracted from the seed. Flaxseed contains from 35 to 45 per cent oil. About 70 per cent of the world production of industrial vegetable oil is produced from flaxseed. Linseed oil is used in the manufacture of paints and varnishes, linoleum, oilcloth, printer's ink, soaps, putty, patent and imitation leather, and for special lubricating purposes. In some Asian countries, the oil is used for edible purposes. Linseed oilcake or oilcake meal, the by-product of the production of linseed oil, is used as a protein supplement in livestock feeds. The meal is about 35 per cent protein, of which 85 per cent is digestible. In Canada, a small quantity of flax straw is used as a source of fibre for the production of cigarette and fine bond paper.

WORLD PRODUCTION AND TRADE IN FLAXSEED AND FLAXSEED PRODUCTS

More than half of the world's flaxseed is grown in the United States, Argentina and Canada. These countries are also the main sources of exports of flaxseed and flaxseed products. Large quantities of flaxseed are grown in the U.S.S.R. and India but production in these countries is largely for home consumption. Europe is not a producer of large quantities of flaxseed—the largest production has been in Poland, where less than 3 million bushels are produced annually. Reports indicate that the European Economic Community is considering a plan to encourage the production of flaxseed.

World flaxseed production was 147.6 million bushels in 1965 (Table 1). Production decreased in 1966 and again in 1967 but increased in 1968 and again in 1969. Production in 1969 is estimated at 139.5 million bushels, 4.5 million bushels more than the average during 1962-66. These changes in world production were almost all due to changes in production in Canada and the United States. Estimates show production in these two countries in 1969 at the highest levels of recent years. Production in Argentina during the past five years was considerably lower than it was earlier in the sixties.

The world export trade in flaxseed is dominated by Canada and the United States, which together supply about 90 per cent of exports (Table 2). Before 1968, Canada supplied substantially more than half of the world's exports of flaxseed. Canadian exports decreased in 1967 and again in 1968. Coun-

tries exporting smaller quantities of flaxseed include Belgium-Luxembourg, Ethiopia, Netherlands, Iraq and Afghanistan. Argentina imposes a heavy tax on flaxseed exports and therefore exports little. World exports of flaxseed of 22 million bushels in each of 1967 and 1968 were 2 million bushels less than the average during 1962-66. Exports are reported to have increased considerably in 1969.

World exports of linseed oil were 196,669 tons (equivalent to about 19 million bushels of flaxseed) in 1968 (Table 3). This was a substantially smaller quantity than was exported in preceding years. Export trade in linseed oil in 1969 is reported to have been considerably larger than in 1968. Argentina dominates the export trade in linseed oil but exports from this country were down substantially in 1968, probably partly due to the small crop in 1967. The United States is the second largest exporter of linseed oil; the quantity exported fluctuates considerably from year to year. Uruguay has been an important exporter but exports from this country have been declining steadily. Exports from the EEC countries of Belgium-Luxembourg, West Germany and the Netherlands increased slightly in recent years. Canadian exports of 11,493 tons in 1968 were the same as in 1965, 7,023 tons more than in 1967, but 4,857 tons less than the average during 1962-66. Canada's exports are a very small part of total world exports.

The quantity of linseed meal exported annually decreased steadily during the 1960's (2). In 1962-66, linseed meal was 7 per cent of world exports of oilcake and meals; in 1968 it was only 3.6 per cent.

Importers of the largest quantities of flaxseed are Japan, United Kingdom, Spain and the EEC countries of West Germany, Belgium-Luxembourg, Netherlands and France. The main markets for Canadian exports of flaxseed have been Japan, United Kingdom and the Netherlands (Table 4). Annual importers of smaller quantities of Canadian flaxseed are Belgium, West Germany, Norway, and Spain. Many of the European countries have been intermittent purchasers of Canadian flaxseed, buying quantities which varied considerably from year to year.

Prices of flaxseed and its products on world markets fluctuate from year to year but not to the same extent as supply. The average price for flaxseed was US \$143 a metric ton in 1968, down from the average of US \$147 a metric ton during 1959-63 (2).

TABLE 1—FLAXSEED, PRODUCTION BY MAJOR PRODUCING COUNTRIES AND ESTIMATED WORLD TOTAL, AVERAGE 1962-66, ANNUAL 1964 TO 1969

Country	Average 1962-66	1964	1965	1966	1967	1968*	1969*
thousand bushels							
Canada.....	21,732	20,305	29,176	22,020	9,378	19,666	30,748
United States.....	29,389	24,401	35,402	23,390	20,036	27,264	36,094
Argentina.....	28,121	32,085	22,440	22,715	15,157	20,078	21,000
Uruguay.....	2,330	2,808	1,482	1,590	1,057	2,202	n.a.
Poland.....	2,598	2,165	3,031	2,834	2,874	2,756	2,360
Romania.....	992	n.a.	n.a.	1,480	1,550	1,190	1,585
U.S.S.R.....	19,650	17,600	22,835	20,115	20,905	20,670	20,668
India.....	16,637	14,920	19,806	13,196	10,232	17,243	13,858
Others.....	13,476	16,816	13,455	11,688	10,794	10,134	13,256
World Total.....	134,925	131,100	147,627	119,028	91,983	121,203	139,509

n.a. = not available.

* Preliminary.

Sources: (1) *Foreign Agriculture Circular, Fats, Oils and Oilseeds*, Foreign Agricultural Service, United States Department of Agriculture, Washington, D.C., October 1969.

(2) *World Agricultural Production and Trade*, Foreign Agricultural Service, United States Department of Agriculture, Washington, D.C., November 1969.

(3) *Field Crop Reporting Series—No. 20*, Cat. No. 22-002, Dominion Bureau of Statistics, Ottawa.

TABLE 2—FLAXSEED: EXPORTS FROM SPECIFIED COUNTRIES, AVERAGE 1962-66, ANNUAL 1964 TO 1968

Country	Average 1962-66	1964	1965	1966	1967	1968
thousand bushels						
Canada.....	14,839	14,844	16,100	20,199	13,920	10,959
United States.....	4,977	6,947	3,925	6,663	6,029	9,102
Belgium-Luxembourg.....	1,104	1,153	1,463	1,173	1,219	987
Netherlands.....	441	399	578	324	287	258
Poland.....	11	12	27	18	97	57
Ethiopia.....	975	1,222	760	414	382	394
Morocco.....	97	77	131	113	81	0
Afghanistan.....	362	503	407	87	135	100
Iraq.....	240	382	191	281	150	150
Others.....	955	221	347	75	30	1
Total.....	24,001	25,760	23,929	29,347	22,330	22,008

Source: *Foreign Agriculture Circular, Fats, Oils and Oilseeds*, Foreign Agricultural Service, United States Department of Agriculture, Washington, D.C. October 1969.

TABLE 3—LINSEED OIL: EXPORTS FROM SPECIFIED COUNTRIES, AVERAGE 1962-66, ANNUAL 1964 TO 1968

Country	Average 1962-66	1964	1965	1966	1967	1968
tons						
Canada.....	6,636	9,498	11,259	6,180	4,470	11,493
United States.....	20,984	9,552	20,868	63,051	22,680	54,891
Argentina.....	229,853	226,104	263,528	133,882	232,734	87,082
Uruguay.....	20,293	11,567	19,166	17,199	13,791	8,344
European Economic Community:						
Belgium-Luxembourg.....	2,454	2,719	1,691	4,293	5,134	6,976
France.....	985	995	1,442	1,105	1,058	535
Italy.....	168	15	16	15	23	8
West Germany.....	5,168	5,872	5,346	2,976	3,090	8,399
Netherlands.....	7,327	4,452	5,331	5,960	6,462	9,743
Total EEC.....	16,102	14,053	13,826	14,349	15,767	25,661
United Kingdom.....	7,984	6,362	8,063	9,168	8,394	8,165
India.....	759	1,632	552	43	11	54
Japan.....	753	1,115	736	931	574	892
Others.....	636	571	729	594	323	87
Total.....	304,000	280,454	338,727	245,397	298,744	196,669

Source: *Foreign Agriculture Circular, Fats, Oils and Oilseeds*, Foreign Agricultural Service, United States Department of Agriculture, Washington, D.C. October 1969.

Prices in 1966 averaged US \$128 a ton. Similarly, linseed oil prices are below those of a decade ago but higher than prices in the intervening years. The 1968 price was US \$227 a metric ton compared with the average of US \$250 during 1959-63. Since the mid-

sixties, linseed meal prices have been fairly constant at a level about 10 per cent higher than during 1959-63. Meal prices in 1968 averaged US \$100 a metric ton compared with US \$93 during the earlier period.

TABLE 4—EXPORTS OF FLAXSEED FROM CANADA BY MAIN RECIPIENT COUNTRIES, AND TOTAL IMPORTS BY COUNTRIES,^a AVERAGE 1962-66, ANNUAL 1964 TO 1968

Country	Average 1962-66		1964		1965		1966		1967		1968	
	Total Im- ported	From Canada	Total Im- ported	From Canada	Total Im- ported	From Canada	Total Im- ported	From Canada	Total Im- ported	From Canada	Total Im- ported	From Canada
thousand bushels												
Belgium.....	1,378	588	1,420	334	1,071	400	2,183	1,378	1,653	119	2,027	114
France.....	2,879	583	3,461	725	2,503	611	2,951	412	727	—	1,177	367
West Germany..	1,577	885	1,636	792	1,690	1,137	3,290	1,587	2,220	942	4,386	606
Italy.....	264	87	155	19	195	19	246	316	330	41	251	35
Netherlands... United Kingdom....	3,097	2,236	3,010	2,124	2,773	2,939	4,631	4,400	4,436	3,321	3,055	1,551
Finland.....	4,610	4,625	4,546	5,046	5,007	5,084	3,947	4,006	3,773	3,267	2,418	2,369
Norway.....	463	71	478	89	429	—	281	107	415	—	200	36
Spain.....	410	295	583	320	255	270	445	410	205	196	302	181
Czechoslovakia..	773	510	1,012	571	584	391	1,433	1,226	904	800	1,072	548
Yugoslavia.....	n.a.	218	n.a.	241	n.a.	—	n.a.	534	n.a.	370	n.a.	400
Japan.....	n.a.	427	n.a.	354	n.a.	922	n.a.	734	n.a.	197	n.a.	—
World Totals...	3,897	3,853	3,733	3,734	4,063	4,091	4,589	4,439	4,201	4,339	3,952	3,727
	23,135	14,881	24,587	14,849	22,532	16,311	28,321	20,198	22,022	13,919	22,026	10,956

n.a. = not available.

— = none reported.

^a Due to irregularities in reporting periods, Canadian exports, in several instances, are indicated at higher levels than total imports.

Sources: (1) *Foreign Agriculture Circular, Fats, Oils and Oilseeds*, Foreign Agricultural Service, United States Department of Agriculture, Washington, D.C., October 1969.

(2) *Trade of Canada, Exports by Commodities*, Cat. No. 65-004, Dominion Bureau of Statistics, Ottawa.

TABLE 5—FLAXSEED ACREAGE, BY PROVINCE, CANADA, 1950 TO 1969

Year	Canada		Quebec		Ontario		Manitoba		Saskatchewan		Alberta		British Columbia	
	Thou- sand acres	Per- centage of all acres Canada	Thou- sand acres	Per- centage of all acres Canada	Thou- sand acres	Per- centage of all acres Canada	Thou- sand acres	Per- centage of all acres Canada	Thou- sand acres	Per- centage of all acres Canada	Thou- sand acres	Per- centage of all acres Canada	Thou- sand acres	Per- centage of all acres Canada
Average 1950-54	997.3	—	—	48.0	4.8	468.4	47.0	327.8	32.9	145.8	14.6	7.3	0.7	
Average 1955-59	2,593.1	—	—	18.3	0.7	662.0	25.5	1,411.2	54.4	493.4	19.0	8.2	0.4	
1960...	2,513.4	5.9	0.2	20.0	0.8	707.0	28.1	1,209.0	48.1	565.0	22.5	6.5	0.3	
1961...	2,086.0	10.6	0.5	21.3	1.0	748.0	35.8	941.0	45.1	362.0	17.4	3.1	0.2	
1962...	1,446.4	25.4	1.8	22.8	1.6	667.0	46.1	389.0	26.9	340.0	23.5	2.2	0.1	
1963...	1,682.4	29.0	1.7	23.0	1.4	820.0	48.7	506.0	30.1	303.0	18.0	1.4	0.1	
1964...	1,977.0	35.7	1.8	23.0	1.2	1,025.0	51.8	521.0	26.4	370.0	18.7	2.3	0.1	
Average 1960-64	1,941.0	21.3	1.1	22.0	1.1	793.4	40.9	713.2	36.7	388.0	20.0	3.1	0.2	
1965...	2,314.7	28.0	1.2	20.0	0.9	1,350.0	58.3	560.0	24.2	355.0	15.3	1.7	0.1	
1966...	1,917.7	18.5	1.0	14.5	0.7	1,107.0	57.7	429.0	22.4	347.0	18.1	1.7	0.1	
1967...	1,023.4	17.0	1.7	7.0	0.7	660.0	64.5	193.0	18.8	145.0	14.2	1.4	0.1	
1968...	1,524.4	15.6	1.0	6.0	0.4	820.0	53.8	397.0	26.0	285.0	18.7	0.8	0.1	
1969...	2,440.7	16.8	0.7	3.0	0.1	1,100.0	45.1	770.0	31.5	550.0	22.5	0.9	0.1	
Average 1965-69	1,844.2	19.2	1.1	10.1	0.5	1,007.4	54.6	469.8	25.5	336.4	18.2	1.3	0.1	

— = none reported

Sources: *Handbook of Agricultural Statistics*, Part 1—Field Crops, Cat. No. 21-507, and *Quarterly Bulletin of Agricultural Statistics*, Cat. No. 21-003, Dominion Bureau of Statistics, Ottawa.

TABLE 6—FLAXSEED: YIELD PER ACRE, PRODUCTION, AVERAGE FARM PRICE AND TOTAL FARM VALUE, CANADA, 1950-51 TO 1969-70

	Average Yield Per Seeded Acre	Total Production	Average Farm Price Per Bushel	Total Farm Value
	bushels	thousand bushels	dollars	thousand dollars
Average				
1950-55	9.4	9,369	3.05	28,563
Average				
1955-60	8.7	22,544	2.68	60,441
1960-61	9.0	22,571	2.75	62,173
1961-62	6.9	14,478	3.32	48,131
1962-63	11.1	16,065	3.06	49,156
1963-64	12.6	21,116	2.91	61,475
1964-65	10.3	20,305	2.94	59,745
Average				
1960-65	9.7	18,907	2.97	56,136
1965-66	12.6	29,176	2.71	79,026
1966-67	11.5	22,020	2.72	59,902
1967-68	9.2	9,378	3.08	28,845
1968-69	12.9	19,666	n.a.	n.a.
1969-70	12.6	30,748	n.a.	n.a.
Average				
1965-70	12.0	22,198	n.a.	n.a.

n.a. = not available.

Sources: *Handbook of Agricultural Statistics*, Part 1 - Field Crops, Cat. No. 21 - 507, and *Quarterly Bulletin of Agricultural Statistics*, Cat. No. 21 - 003, Dominion Bureau of Statistics, Ottawa.

TABLE 7—FLAXSEED CRUSHINGS AND PRODUCTION OF OIL AND MEAL, CANADA, 1957-58 TO 1968-69

	Crushings	Oil Produced	Oil Meal Produced
	thousand bushels	thousand tons	thousand tons
1957-58	3,617	36.1	62.4
1958-59	3,301	32.2	57.2
1959-60	2,606	25.6	44.9
1960-61	2,916	28.8	50.5
1961-62	2,465	24.0	42.9
1962-63	2,529	24.6	43.1
1963-64	2,752	26.6	47.8
1964-65	2,901	27.8	50.9
1965-66	2,631	25.7	44.9
1966-67	2,543	25.2	43.7
1967-68	2,266	22.4	39.1
1968-69	2,085	20.5	35.8

Source: *Oils and Fats*, Cat. No. 32-006, Dominion Bureau of Statistics, Ottawa.

TABLE 8—CONSUMPTION OF LINSEED OIL BY CANADIAN INDUSTRIES, 1963 TO 1966

Utilizing Industry	1963	1964	1965	1966
	thousand gallons			
Paint and varnish	2,201	2,300	2,012	1,793
Linoleum and coated fabrics	491	383	314	305
Plastics and synthetic resins	155	206	256	250
Miscellaneous chemicals	92	102	154	195
Printing inks	69	99	116	87
Iron and steel mills	24	21	23	28
Industrial chemicals	5	28	58	79
Soap and cleaning compounds	7	6	6	6
Total	3,044	3,145	2,939	2,743

Source: *Vegetable Oil Mills*, Cat. No. 32-223, Dominion Bureau of Statistics, Ottawa.

TABLE 9—CANADIAN EXPORTS OF FLAXSEED, LINSEED OIL AND LINSEED MEAL, AVERAGE 1962-66, ANNUAL 1962 TO 1968 (CROP YEAR AUGUST 1 TO JULY 31)

	Flaxseed	Linseed Oil	Linseed Meal
	thousand bushels	thousand tons	thousand tons
Average 1962-63 to 1966-67.....	15,298	6,788	15,535
1962-63.....	11,842	4,141	13,385
1963-64.....	13,740	5,877	11,400
1964-65.....	14,614	13,222	23,357
1965-66.....	18,728	5,640	15,161
1966-67.....	17,564	5,058	14,373
1967-68.....	12,981	10,993	6,990
1968-69.....	13,146	5,433	5,929

Source: *Trade of Canada, Exports by Commodities*, Cat. No. 65-004, Dominion Bureau of Statistics, Ottawa.

FLAXSEED PRODUCTION IN CANADA

There is considerable variation in the acreage of flax seeded annually in Canada, but since 1957 the trend has been for the area to decrease. During the 1955-59 period, Canadian flax acreage averaged 2.6 million acres a year (Table 5). During 1965-69, the average area seeded was 1.8 million acres. In 1968 and 1969 there were increases in the area seeded to flax but such increases are not likely to continue because of inherent marketing problems.

In Canada, flax is grown mainly in the Prairie Provinces, the largest acreage being in Manitoba. During 1955-59, about 26 per cent of the Canadian flax acreage was in Manitoba and the proportion increased to almost 55 per cent during 1965-69. This was the opposite of the trend in Saskatchewan where 54 per cent of the Canadian acreage was grown during 1955-59 but only 26 per cent during 1965-69. On the basis of five-year averages, flax acreage in Alberta also has been declining. About one per cent of the Canadian flax acreage is grown in Quebec and still smaller acreages are grown in Ontario and British Columbia. The flax acreage in these three provinces also has been declining. Canada's flaxseed acreage has fluctuated sharply in the last two decades; for example, 1969 acreage was more than double the acreage in 1967.

The average yield per acre of flax in Canada has been increasing. The average yield per acre was 11.8 bushels for the 1965-69 period, up from 10 bushels during 1960-64 (Table 6). During the past 2 decades, yields per acre have been as high as 12.9 bushels and as low as 5.5 bushels. Average yields per acre are higher in Alberta than in the other Prairie Provinces. During 1965-69, average yields per acre were 14.2 bushels in Alberta, 12.3 bushels in Saskatchewan, and 10.5 bushels in Manitoba.

Canadian flaxseed production is estimated at 30.7 million bushels in 1969. Production averaged 22.2 million bushels during 1965-69, 3.3 million bushels more than during 1960-64, but the same as during

1955-59. During the past 2 decades, production has had very marked fluctuations—from 5 million to 35 million bushels.

Average farm prices for flaxseed were somewhat more stable during the sixties than during the fifties. During the earlier decade, farm prices fluctuated between \$2.44 and \$3.90 a bushel, and during the later decade between \$2.75 and \$3.32 a bushel. The total farm value of production fluctuates considerably from year to year. In 1965-66, total farm value was \$79 million, 2 years later in 1967-68 it was only \$28.8 million.

CANADIAN UTILIZATION OF FLAXSEED AND FLAXSEED PRODUCTS

The quantity of flaxseed crushed annually in Canada decreased by 43 per cent between 1957-58 and 1968-69 (Table 7). There was little irregularity in the downward trend from 3.7 million bushels to 2.1 million bushels. The oil produced decreased from 36,100 tons in 1957-58 to 20,500 tons in 1968-69, and the meal produced decreased from 62,400 tons to 35,800 tons.

The utilization of linseed oil in the manufacture of paint, varnish and linoleum has been declining steadily (Table 8). There has been some increase in utilization in the plastic and chemical industries but it has not offset the declines in what have been the main industrial uses. Consumption of linseed oil by the paint and varnish industry decreased by more than 5 million gallons from 1964 to 1966. Increased use in the plastics and chemicals industry reduced the overall decrease to 4 million gallons.

More than 75 per cent of Canada's flaxseed production is exported in the form of flaxseed. A small quantity is exported in the form of linseed oil and linseed meal. Exports of flaxseed averaged 15.3 million bushels a year during the period 1962-63 to 1966-67 (Table 9). In 1967 and 1968, they were about 13 million bushels. Exports of linseed oil were about 5 million tons in 5 of the 7 years, 1962-63

to 1968-69. Linseed oil exports were unusually high in 1964-65 at 13.2 million tons and in 1967-68 at 11 million tons. Exports of linseed meal averaged 15.5 million tons a year during 1962-63 to 1966-67, but declined sharply to 7 million tons in 1967-68 and to 6 million tons in 1968-69.

OUTLOOK FOR FLAXSEED PRODUCTION IN CANADA

The outlook for flaxseed production cannot be described as optimistic. Nowhere is there a strong trend for utilization of flaxseed products to increase. In many countries utilization of linseed oil remains more or less stable, but in the United Kingdom, United States and Canada, it has been decreasing. Synthetic substitutes are replacing linseed oil in many of its uses. This trend will continue unless prices of linseed oil can be kept competitive with available substitutes. Unless new uses for linseed oil are rapidly developed, a slow downward trend in flaxseed production is the prospect for the next few years.

Canada depends upon world markets for disposal of the largest part of the flaxseed crop. The United States and Argentina, Canada's main competitors, are likely to continue strong in world markets for flaxseed and flaxseed products. Larger than normal stocks recently have gone into loan in the U.S., even though the loan rate was reduced from \$2.90 to \$2.75 a bushel. If the EEC includes flaxseed in the

subsidized farm program, production will likely increase thus influencing Canada's exports to that region. Small quantities of flaxseed were exported to Australia in 1968 and 1969 but this is not likely to be a large market. Sales to Japan should continue at present levels, possibly with a slow increase.

On the domestic market, prospects for increased use of flaxseed products are not promising for the near future. Synthetics undoubtedly will continue to take a large part of the market in the paint and varnish industry. The plastics and chemical industries should continue to take increasing quantities but this is not likely to offset decreased use in the paint and varnish industry for some years.

A production of 25 million bushels of flaxseed in Canada in 1970 should be adequate to cover all export and domestic requirements without reducing stocks. This quantity can probably be produced on 2 million acres, 0.4 million acres less than were seeded in 1969. During the next ten years, demand will probably fluctuate but on average will move downward. Projections indicate that 1.5 million acres of flaxseed in Canada will be adequate to meet market demands by the end of the next decade.

REFERENCES

- (1) *World Agricultural Production and Trade*, Foreign Agricultural Service, United States Department of Agriculture, Washington, D.C.
- (2) *Foreign Agriculture Circular, Fats, Oils and Oilseeds*, Foreign Agricultural Service, United States Department of Agriculture, Washington, D.C.

POLICY AND PROGRAM DEVELOPMENTS

Prince Edward Island Potato Marketing Order—An Order in Council authorizes the Prince Edward Island Potato Marketing Board to regulate the marketing of potatoes in interprovincial and export trade, and to fix, impose and collect levies of three-quarters of a cent per hundred pounds on all sales of Prince Edward Island produced potatoes sold to processors and one and one-half cents per hundred pounds on all other sales of potatoes. These powers expire December 31, 1970. This Order in Council revokes the previous Order in Council, P.C. 1963-1767. (November 12, 1969)

Ontario Crop Insurance—The crop insurance program in Ontario has been extended to cover tomato and potato crops. There have also been minor changes in the program regarding yield statistics

and eligible areas. The crops now eligible for crop insurance in Ontario are: winter wheat, spring grain, forage, grain corn, soybeans, white beans, tomatoes and potatoes. (November 12, 1969)

Ontario Turkey Producers' Marketing Order—The Ontario Turkey Producers' Marketing Board is authorized to regulate the marketing of turkeys in interprovincial and export trade. (December 17, 1969)

Hog Quality Premium—Effective January 5, 1970, the Federal Government will pay a quality premium of \$1.50 on each hog carcass scoring an index of 105 or more. This is a reduction from the premium of \$3.00 paid since March 31, 1969. (December 31, 1969)

RESOURCE USE EFFICIENCY AS RELATED TO FARM BUSINESS SIZE IN THE RED DEER AREA OF ALBERTA

L. M. L. Rokosh, J. H. Lovering and J. E. Elsom

Increases in farm business size have been, and will continue to be, of major importance in maintaining or achieving acceptable levels of resource use efficiency and net income. Management ability also continues to be a crucial variable in the determination of these levels. The losses in aggregate net agricultural incomes due to size and management deficiencies appear to be sufficiently large to warrant new policies to provide the impetus for more rapid adjustments in farm businesses.

This paper is the second report on a research project started in 1967 under the title, "An Examination of the Extent, Need and Process of Farm Business Enlargement in the Parkland Areas of the Prairies". The objectives of this project are: (1) to examine the nature and extent of changes in farm business size and structure, (2) to determine whether or not existing businesses are of sufficient size to make good use of available resources, and (3) to estimate whether or not, within a reasonable length of time, the observed rate of change is sufficient to close any "efficiency gaps" that may exist. The first objective was the subject of a report previously published (1).

The conclusions of the first report were: (1) that large businesses grew faster, (2) that increases in livestock relative to crops were a significant part of expansion, (3) that rapid size growth did not, in this instance, raise liability levels, and (4) that labor efficiency improved in the larger and developing businesses.

The purpose of the present article is to report on the second and third objectives listed above. In subsequent pages a "standard" of business size and efficiency will be presented and farm businesses in the Red Deer area (2) as of 1967 will be compared with this standard, both in terms of size and efficiency. The results of the comparison will indicate whether any adjustments are needed and what the nature of such adjustments should be.

1967 POSITION OF FARM BUSINESSES

The study farms were classified into five groups on the basis of the number of productive man work units (PMWU's) per farm in 1967 (3) (Tables 1 and 2). As was anticipated from the data included in the first report, the largest businesses tended to increase in size at the highest rate (increased livestock numbers accounted for a significant part of the expansion) and the smallest businesses decreased in size. The increase in average total PMWU's from 1962 to 1967 for the size classes 501 to 700, 701 to 900, and more than 900 was 34, 15 and 47 per cent respectively, whereas for smaller businesses, less than 300 and 301 to 500, the change was -7 and 9 per cent respectively (Table 2). The increase in average livestock PMWU's for the size classes 501 to 700, 701 to 900 and more than 900 PMWU's was 32, 7 and 72 per cent respectively.

Data showing average labor income, total costs including an allowance for labor and management consisting of \$3,000 plus 5 per cent of total receipts,

TABLE 1—DISTRIBUTION OF FARMS BY SIZE CLASS, 1962 AND 1967, PERCENTAGE OF TOTAL CULTIVATED ACREAGE, AND AVERAGE AGE OF OPERATOR, BY FARM SIZE BASED ON PRODUCTIVE MAN WORK UNITS (PMWU), 1967

Size Class	Number of Farms	Percentage of all Farms	Percentage of all Farms	Percentage of Total Cultivated Acreage	Average Age of Operator
	1967	1967	1962 ^a	1967	1967
number of PMWU's					
300 or less.....	17	36	40	20	57
301 to 500.....	12	25	28	24	45
501 to 700.....	6	13	21	14	46
701 to 900.....	5	11	4	15	46
More than 900.....	7	15	27	27	49
All Sizes.....	47	100	100	100	51

^a Only for those farm businesses still in operation in 1967.

TABLE 2—CHANGES IN FARM BUSINESS SIZE AND COMBINATION OF FARM ENTERPRISES, BY FARM SIZE BASED ON PRODUCTIVE MAN WORK UNITS (PMWU), 1962 TO 1967

Size Class	Average Total Cultivated Acreage			Average Total PMWU			Average Crop PMWU			Average Livestock PMWU		
	1967	1962*	Per- centage Change	1967	1962*	Per- centage Change	1967	1962*	Per- centage Change	1967	1962*	Per- centage Change
number of PMWU's												
300 or less.....	234	226	2	196	210	-7	130	114	15	66	108	-34
301 to 500.....	397	367	8	422	388	9	211	187	13	211	201	5
501 to 700.....	480	403	19	604	451	34	256	197	30	348	255	32
701 to 900.....	587	473	24	794	691	15	346	273	27	448	419	7
More than 900.....	793	676	17	1,171	797	47	542	431	26	629	336	72
All Sizes.....	428	378	13	515	425	21	251	207	21	263	221	19

* Only for those farm businesses still in operation in 1967.

TABLE 3—FARM SIZE, LABOR INCOME, TOTAL RECEIPTS, AND TOTAL COSTS PER FARM AND RATIO OF TOTAL COSTS TO TOTAL RECEIPTS, BY FARM SIZE BASED ON PRODUCTIVE MAN WORK UNITS (PMWU), 1967

Size Class	Average Size	Labor Income	Total Receipts	Total Costs*	Ratio of Total Costs to Total Receipts
number of PMWU's	number of PMWU's		dollars per farm		
300 or less.....	196	1,157	10,691	13,241	1.24
301 to 500.....	422	5,408	23,787	22,312	0.94
501 to 700.....	604	2,361	29,268	31,369	1.07
701 to 900.....	794	7,132	39,203	37,031	0.94
More than 900.....	1,171	13,211	84,923	79,150	0.93
All Sizes.....	515	4,827	30,495	30,218	0.99

* Total costs include returns to labor and management.

the ratio of total costs to total receipts (TC:TR) and the PMWU's for 5 PMWU classes are contained in Table 3. There is a direct relationship between size class (number of PMWU's) and each of labor income, total receipts and total costs. There is a small but statistically significant inverse correlation between the ratio of total costs to total receipts (TC:TR) and size of business ($r^2=0.21$), at a 95 per cent level of confidence.

Only 1 of 17, or 6 per cent, of the businesses in the less than 300 PMWU class had TC:TR as low as 1.00 whereas 49, 17, 60 and 72 per cent of the businesses had TC:TR of 1.00 or less in the 301 to 500, 501 to 700 and 701 to 900 and more than 900 PMWU classes respectively (Table 4). A large percentage of farm businesses in the 301 to 500 PMWU size class are in TC:TR classes considered efficient.

Table 5 shows average PMWU's, man equivalents, PMWU per man equivalent, total receipts, labor incomes and equipment investment per acre for six TC:TR classes. Efficiency in the use of labor, as measured by PMWU per man equivalent, appears to be an important aspect of overall resource use

efficiency. The output per man is greater for the more efficient TC:TR classes.

A "STANDARD" OF COMPARISON

The identification of the business size that yields all economies of scale can be made with reasonable accuracy only when enterprise mix and input-output relationships have been specified. The crudeness of the estimate increases as businesses of differing character are considered. In addition, ways of measuring farm business size are imperfect for the purposes of this paper. The productive man work unit (PMWU) system has, however, been chosen as the least imperfect.

Studies of farm business financial statements indicate that business size is not necessarily related closely to efficiency. It is usually possible to find a significant number of relatively small businesses that show high returns to all the resources employed and vice versa because of differing management inputs. This means that to deal properly with the relationships between size and efficiency, management must be held constant.

TABLE 4—PERCENTAGE DISTRIBUTION OF FARM BUSINESSES BY PRODUCTIVE MAN WORK UNITS (PMWU) AND BY RATIO OF TOTAL COSTS TO TOTAL RECEIPTS (TC:TR), 1967

TC:TR Classes	PMWU Class				
	300 or less	301 to 500	501 to 700	701 to 900	More than 900
	per cent				
0.70 or less.....	—	8	—	—	—
0.71 to 0.80.....	—	8	—	40	—
0.81 to 0.90.....	—	25	17	—	43
0.91 to 1.00.....	6	8	—	20	29
1.01 to 1.10.....	23	25	50	20	14
1.11 to 1.20.....	30	8	33	—	14
More than 1.20.....	41	18	—	20	—
Totals.....	100	100	100	100	100

TABLE 5—NUMBER OF FARMS, SIZE, MAN EQUIVALENTS, AGE OF OPERATOR, LABOR EFFICIENCY, LABOR INCOME AND TOTAL RECEIPTS, PER FARM, AND EQUIPMENT INVESTMENT PER ACRE, BY RATIO OF TOTAL COSTS TO TOTAL RECEIPTS (TC:TR), 1967

TC:TR Classes	Number of Farms	Average Size	Man Equivalents Per Farm	Age of Operator	PMWU per Man Equivalent	Equipment Investment Per Acre	Average Labor Income	Average Total Receipts
	number of PMWU's			years	number		dollars	
0.80 or less.....	4	582	1.4	48	416	41.67	12,691	32,303
0.81 to 0.90.....	6	824	1.9	44	430	65.47	15,184	60,744
0.91 to 1.00.....	6	695	1.9	55	358	49.44	6,886	57,218
1.01 to 1.10.....	11	481	1.4	49	335	45.69	3,289	22,798
1.11 to 1.20.....	9	415	1.2	47	333	47.37	705	24,774
More than 1.20.....	11	326	1.1	56	290	42.73	-593	18,825

The linear programming procedure with management held constant was used to investigate the relationship between size of business and efficiency of resource use. The enterprises and input-output relationships used were similar to those of well-run businesses in the Red Deer area of Alberta.

Figure 1 shows the relationship between size of business, as measured by PMWU's, and efficiency, as measured by the ratio of total costs to total receipts. Total costs include all variable expenses, depreciation on capital items, interest on all investment at 6 per cent and labor and management valued at \$3,000 plus 5 per cent of total receipts.

There is no clear boundary to indicate the size beyond which the efficiency ratio becomes constant, that is, when the ratio no longer changes with increases in size. In the authors' judgment, 1,300 PMWU's is the size that achieves nearly all available economies of scale. Beyond this point there are no economic advantages to becoming larger. It is to be emphasized that this standard can only be a guide, and that it is relevant only to farms having an enterprise mix similar to those in the Red Deer area.

The valuation of a number of items included in total costs is quite subjective. Opportunity cost and the charge for operator labor and management are

the most important of these items. In particular, the use of a different valuation procedure for operator labor and management can drastically change the estimates of losses due to management. A higher charge for these services will reduce the estimated efficiency of the area's businesses. Compared with present non-agricultural wages, the charge of \$3,000, plus 5 per cent of total receipts for farm operator labor and management is low.

The general notion of economies of scale is based on lower fixed costs per unit of output, some changes in returns and variable costs because of high volume sales and purchases, the "lumpiness" of certain input items and a curvilinear production function in which the ratio between inputs and outputs varies. The use of this notion in formulating policy depends on the explicit recognition of management as a factor of production. Economies of scale that may be derived from increased business size may be offset by management deficiencies that result in a variety of production inefficiencies. In other words, the model showing the relationship between business size and efficiency is based on the assumption that management ability is not a limiting factor.

From this it is clear that the applicability of the size standard of 1,300 PMWU's to existing busi-

CALCULATED RELATIONSHIP BETWEEN BUSINESS SIZE AND EFFICIENCY

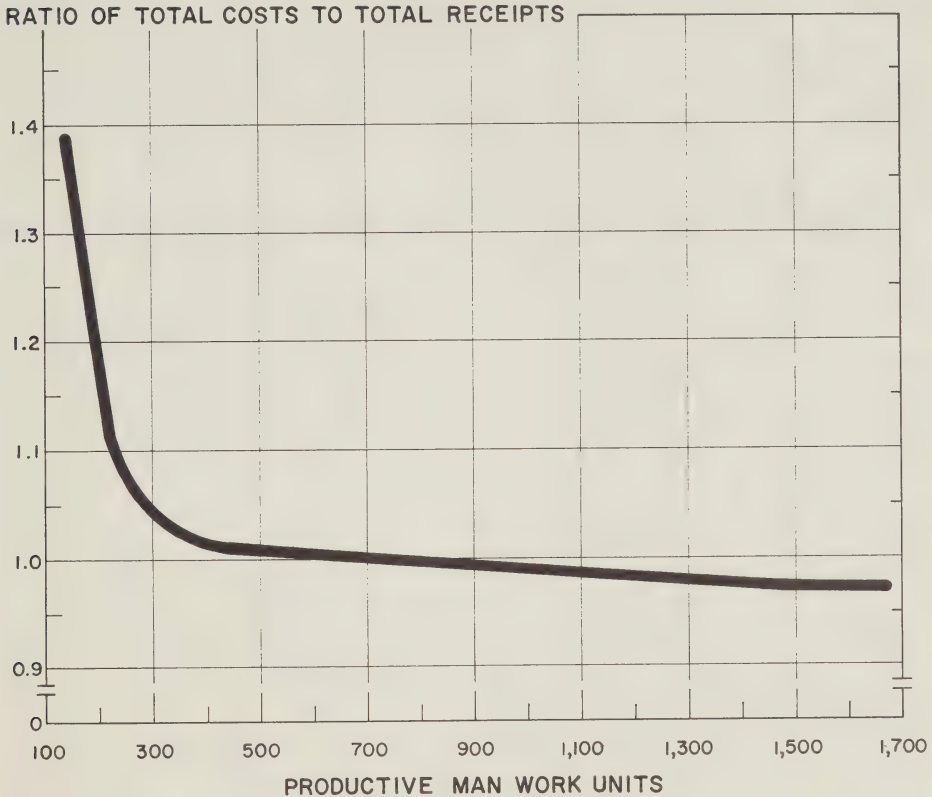


FIGURE 1

nesses in the Red Deer area is initially unknown. The major obstacle in the application of this standard lies in the inability to estimate the operator management levels that are adequate to handle businesses of significantly larger size.

The experience and behavior of progressive farmers in leading agricultural communities such as the Red Deer area continue to be among the more important guides to the evaluation of resource use efficiency and the estimation of the distribution of men according to management ability. A standard which indicates the size that permits the operation

of efficient businesses considering the management abilities of the operators should be useful in showing the size adjustments that appear to be both needed and feasible.

Two-thirds of all businesses larger than 700 PMWU's in the sample have TC:TR less than or equal to 1 (Figure 2). Approximately one-fifth of the businesses with less than 700 PMWU's have TC:TR less than or equal to 1. If the performance of operators in 1967 can be used as a guide to the future performance of the most probable operators of farm businesses in the Red Deer area, then the

DISTRIBUTION OF FARMS BY BUSINESS SIZE AND EFFICIENCY, RED DEER AREA, 1967

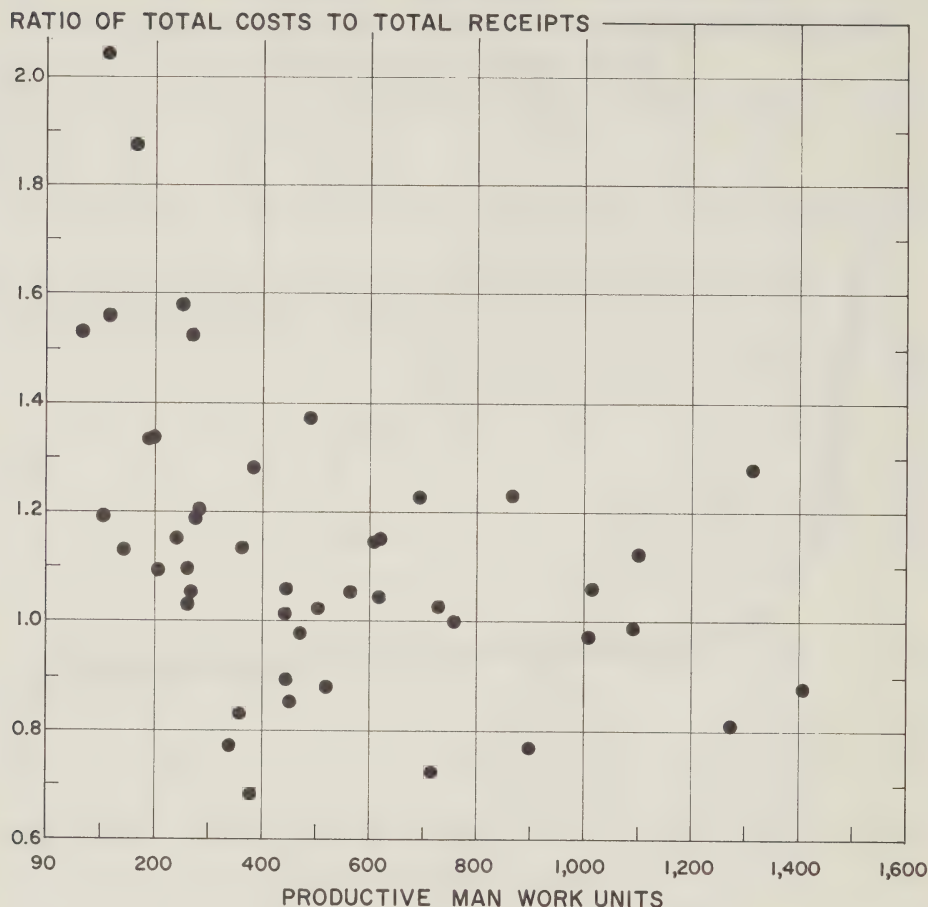


FIGURE 2

above proportions can be used as an estimate of the chances for the operation of efficient businesses with more than and with less than 700 PMWU's.

To evaluate the applicability of the estimated standard, 700 PMWU's, data from two other areas (4) in the black soil zone were used to prepare scatter diagrams similar to that for the Red Deer area. The same proportions were used and the results were similar.

It is possible to use the 700 PMWU size standard and the curve relating size and efficiency to make separate estimates of net income losses that occur as

a result of size and management deficiencies. To estimate the loss in net income that results from the production of a particular output by a business smaller than some specified size, one takes the difference in the two TC:TR values that correspond to the two business sizes in question and multiplies it by the value of the particular output. The TC:TR differential between the 300 and 700 PMWU sizes, for example, is 0.04. In the generation of one dollar of output the operator of the smaller business would have a net income of \$0.04 less than that of the larger business, everything else being the same.

The estimation of losses due to management is somewhat more complicated. First, the estimated operating efficiency (value of TC:TR) is taken from the curve (Figure 1) for the business size. This is the operating efficiency built into the model by the estimates of opportunity cost, charge for operator labor and management, etc., when TC:TR for a 700 PMWU business is set at 1.00. This value of TC:TR is subtracted from the value of TC:TR actually observed in the business and the resultant value is multiplied by that business' total receipts. Suppose that the 300 PMWU business had an observed value of TC:TR equal to 1.15, the loss per dollar of output attributable to management would be $1.15 - 1.04$ or \$0.11.

COMPARISON OF FARM BUSINESSES WITH THE STANDARD

Three of the size classes established fall below 700 PMWU's. The first (less than 300 PMWU's) has 17 businesses. Four of these decreased in size (5) between 1962 and 1967, while the remaining 13 farms increased or maintained their 1962 size. In addition, 11 farm businesses present in 1962 ceased to operate in the ensuing 5 years. This group of 17 businesses decreased in size by an average of 7 per cent (Table 2). If the 4 businesses that decreased in size are excluded, the mean change is nil.

If the size-efficiency relationship shown in Figure 1 is applied to businesses in this class, the loss attributable to inadequate size is \$34,420. The loss attributable to management deficiencies on these farms is \$20,430. The loss to scale and management for the 17 farm businesses in the less than 300 PMWU class is \$54,850.

The mean size of business in the 301-500 PMWU class in 1967 was 422 PMWU's. Of the 12 businesses in the group, 3 decreased in size in the 1962-67 period. The average rate of size increase for the whole group was 9 per cent over the 5-year period. The corresponding rate for the 9 businesses that increased was 23 per cent. At this rate of increase these 9 businesses will require about 12 years to reach 700 PMWU's if the growth is compounded.

At the rate of change observed in the 1962-67 period, the size beyond which two-thirds of the efficient businesses (that is, those with TC:TR less than or equal to 1.00) will be found will have moved from 700 PMWU's to about 980 PMWU's in 5 years. This change represents an uncompounded growth rate of 40 per cent over 5 years of 8 per cent per year. Average business size in the entire sample increased by 24 per cent over 5 years, and the entire sample includes many businesses that became small-

er. A projected rate of change of 8 per cent per year for the size of the standard is not reasonable since it is derived from a consideration of the movement of the more efficient businesses.

If the rate of movement of this standard can be taken as an indicator of the rate of increase in the availability and adoption of new sources of size economies in agriculture, then it is clear that the rate of business size increase in the 301 to 500 PMWU class is inadequate.

The output of the 12 businesses in this class could be maintained by 7 businesses of 700 PMWU's. The approximate savings attributable to size economies would be about \$3,600. The loss attributable to management deficiencies is \$15,380.

The gross output of the 6 businesses in the 501 to 700 PMWU class was about \$175,600 in 1967. The average size for the class was 604 PMWU's. Savings attributable to scale would be about \$1,000, which is probably an amount less than the error inherent in the estimation procedure. Losses attributable to management are about \$16,340.

For all businesses with less than 700 PMWU's, losses attributed to management are \$52,150; those attributed to small scale are \$39,020 per year. Since these losses are for a 20 per cent sample of the Red Deer study area, losses for the population would be about \$455,850 per annum. These losses are about 14 per cent of the aggregate production of all farms smaller than 700 PMWU's in the study area in 1967.

Although there are no losses attributable to small size in businesses larger than 700 PMWU's, there are some management losses. These losses are estimated at \$17,100 for the sample and \$85,500 for all farms larger than 700 PMWU's in the study area. These losses are about 5 per cent of the aggregate production of all farms larger than 700 PMWU's in the study area in 1967.

Both types of loss for all business sizes amount to \$541,350 for the study area, or about 8 per cent of its 1967 gross production. Management and size losses are estimated to be about 5 per cent and 3 per cent respectively of the study area's 1967 gross production. These losses amount to about one-half of the area's total labor income in 1967.

These estimates suggest that losses due to small business size are relatively small for the whole study area. They are, however, more important for the small business sizes (those less than 700 PMWU's) and become of major significance for the less than 300 PMWU size class.

If policy is to be formulated to deal with questions of farm business efficiency and size it is important that a variety of population characteristics be known. One of the most important of these is the age of

farm operators. There is a commonly held view that there is a close relationship between age and efficiency. The view seems justified in this case.

For the purposes of this study it was hypothesized that operators older than 55 years may be expected to incur relatively larger shares of management and size losses than younger operators. Twenty-eight per cent of the operators were more than 55 years of age; they incurred 35 per cent of all the management and size losses estimated for the area despite the fact that they had about 11 per cent of the area's gross receipts. They incurred 26 and 50 per cent of total losses due to management and size deficiencies respectively. About one-third of the operators over 55 years had a business size between 400 and 600 PMWU's; the remainder were smaller. The mean business size was 275 PMWU's. Their mean TC:TR was 1.15. The equivalent values for operators between 30 and 55 years of age were 629 PMWU's and TC:TR of 0.96.

Chi square tests for the independence of operator age class on the distribution of both management and size losses indicate that these losses are not independent of operator age. The tests are statistically significant at the 99.5 per cent confidence level.

CONCLUSION

Many of the losses described result from the typical pattern of capital accumulation and depletion in Canadian farm businesses. The capital depletion stage is often marked by highly inefficient resource use and often represents part payment of the farmers' retirement or semi-retirement income. As long as operator ownership of farm real estate is general, it will be difficult to prevent this kind of loss. If, on the other hand, operator ownership were not general, the kinds of losses described here might be trivial compared to others that might be incurred. These losses can be lessened through increased educational activities, through the provision of alternative retirement possibilities for farm people, and the preparation of well-trained people with sufficient capital resources for the purchase of farms before the depletion stage begins.

There can be little doubt that the easy part of increasing farm business size has to do with the

assembly of physical resources, or the provision of capital. The difficult and most important task will be the development of managerial skills. If there is a high level of managerial skill, it may be hypothesized that business size problems will be less serious.

SOME CAUTIONARY COMMENTS

The foregoing analyses are based on a small sample. But the data and analyses, at this point are intended to apply only to that part of Red Deer County from which they were drawn. Additional work will be needed before it is known to what extent the results can be applied to other areas in the Parkbelt.

The dangers of estimating efficiency from one year's farm business records are fully recognized. As far as can be determined, for the sample as a whole, both 1962 and 1967 may be considered "representative" years.

How sectors in the economy other than agriculture would be affected by farm business size adjustments and increased operating efficiencies, particularly in terms of labor, has not been considered.

NOTES AND REFERENCES

- (1) J. H. Lovering, W. L. Oddie, and L. M. L. Rokosh, "Changes in Farm Structure and Business Size in the Red Deer Area of Alberta, 1962-67," *Canadian Farm Economics*, Vol. 3, No. 5, December 1968.
- (2) The study area was located within Townships 33 to 38 of Ranges 25 to 29, West of the Fourth Meridian, Red Deer County, Alberta.
- (3) A productive man work unit (PMWU) is the amount of directly productive work accomplished by a typical operator using typical production methods in a 10-hour day. A man equivalent is an amount of labor equivalent to 12 months of adult male labor.
- (4) W. M. Bayda, *Changes in Farm Organization, Lundar-Eriksdale Area, Manitoba, 1962*, Economics Division, Administration Branch, Canada Department of Agriculture, Winnipeg, Manitoba.
L. M. Johnson, *Changes in Farm Organization, Reston-Cromer Area, Manitoba, 1965*, Economics Branch, Canada Department of Agriculture, Winnipeg, Manitoba.
- (5) For study purposes, a farm business was considered to have increased or decreased in size over the 5-year period, 1962-67, if there was a change in productive man work units (PMWU's) of more than 10 per cent. Farms with changes of 10 per cent or less in either direction were considered to be unchanged.

CANADIAN FARM ECONOMICS, VOLUME 4 INDEX

TECHNICAL ARTICLES

	Page
No. 1—April 1969	
Prospects for Increasing Beef Supplies in Canada— <i>J. S. Lohar</i>	1
Beef Cattle Production in West Central Manitoba— <i>L. M. Johnson</i>	9
Beef Production on Part-time Ranches on the Interior Plateau of British Columbia, 1966— <i>N. D. Turnbull</i> ...	19
Prospects for Strawberry Production in Canada— <i>Raziuddin M. Siddiqui</i>	23
Policy and Administration of Public Lands in Alberta with Particular Reference to Agriculture— <i>T. F. Joyce</i>	28
No. 2—June 1969	
Grain Corn and Orderly Marketing— <i>G. G. Pearson</i>	1
Factors Affecting the Production of Tomatoes for Processing— <i>J. L. Pando</i>	8
Some Marketing Habits of Prairie Grain Producers— <i>D. Zasada</i>	15
Characteristics of Holders of Small Dairy Quotas— <i>W. Y. Yang</i>	20
Costs of Operating Aircraft for Agricultural and Forestry Use, 1967— <i>L. E. Philpotts and T. O. Riecken</i> ...	24
The International Labour Organization and Canadian Agriculture, 1919 to 1969— <i>A. B. Andarawewa</i>	30
No. 3—August 1969	
Expected Patterns and Practices in Agriculture in 1980— <i>G. R. Purnell, A. B. Andarawewa, R. A. Stutt</i> ...	1
A Review of the World Grain Situation.....	11
Notes on Coarse Grain Production and Marketing in Canada— <i>G. G. Pearson and G. A. Hiscocks</i>	19
The Grain Delivery Quota System of the Canadian Wheat Board.....	21
The Changing Pattern of Turkey Marketings in Canada— <i>J. D. F. Kidd</i>	24
No. 4—October 1969	
The Importance of Agriculture to the Canadian Economy— <i>I. F. Furniss</i>	1
Some Highlights of a Survey of Incorporated Family Farms in Ontario— <i>R. A. Stutt</i>	9
Regional Comparisons of Death Rates of Farm Animals in Canada— <i>W. Y. Yang</i>	14
The Prairie Grain Advance Payments Act, 1957-1968— <i>J. W. Channon</i>	18
No. 5—December 1969	
The Common Agricultural Policy of the EEC and its Implications for Canada— <i>M. N. Gifford</i>	1
The Canadian Apple Industry— <i>J. R. Burns</i>	8
Costs and Returns on Wheat Farms, Central Saskatchewan— <i>E. A. K. Grahalm</i>	18
Policy and Administration of Public Lands in the Atlantic Region with Particular Reference to Agriculture— <i>G. C. Refson</i>	24
No. 6—February 1970	
Canada and the World Food Program— <i>Frank Shefrin</i>	1
Rapeseed Production— <i>J. S. Carmichael and S. W. Garland</i>	11
Flaxseed Production— <i>J. S. Carmichael and S. W. Garland</i>	18
Resource Use Efficiency As Related to Farm Business Size in the Red Deer Area of Alberta— <i>L. M. L. Rokosh,</i> <i>J. H. Lovering and J. E. Elsom</i>	24

POLICY AND PROGRAM DEVELOPMENTS

	Issue Number	Page
Agriculture General		
Economics Branch Appointment.....	3	29
Crop Legislation		
Federal-Provincial Crop Insurance for Quebec.....	2	7
Manitoba Crop Insurance (other crops eligible).....	3	29
Saskatchewan Crop Insurance (other areas eligible).....	3	29
Alberta Crop Insurance (other areas and crops eligible).....	4	21
Ontario Crop Insurance (other areas and crops eligible).....	6	23
Dairy Products		
Dairy Support Prices, 1969-70.....	2	7
Cheddar Cheese Exports.....	3	29
Credit		
Credit for Indian Farmers.....	2	7
Farm Syndicate Loans to Indians.....	5	7
Marketing Orders		
Ontario Tender Fruit Growers' Marketing-for-Processing.....	1	33
Ontario Grape Growers' Marketing-for-Processing.....	1	33
Manitoba Turkey Producers'.....	2	7
Ontario Wheat Producers'.....	4	21
Ontario Bean Producers'.....	4	21
Nova Scotia Hog Producers'.....	4	21
Apple Marketing in Quebec.....	4	21
Ontario Onion Producers'.....	5	7
Prince Edward Island Potato.....	6	23
Ontario Turkey Producers'.....	6	23
Price Stabilization		
Interim Sugar Beet Deficiency Payment.....	1	33
Hog Quality Premium Change.....	2	7
Wool Deficiency Payment.....	2	7
Interim Payment for Pea-Beans and Yellow-eye Beans.....	2	7
Potato Price Stabilization Order.....	2	7
Sugar Beet Support Program.....	4	21
Wool Price Stabilization Order.....	5	7
Sugar Beet Stabilization Order.....	5	7
Feed Freight Assistance Rates.....	5	7
Final Payments to Ontario Bean Producers.....	5	7
Hog Quality Premium Change.....	6	23

(All indexes shown are official, seasonally unadjusted indexes published by the Dominion Bureau of Statistics.)

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	Index of Prices Paid by Farmers				Index of Prices Received by Farmers	Wholesale Price Indexes				Consumer Price Indexes			Production Price Indexes		
	Composite (excluding living costs)		Taxes and interest rates			Canadian Farm Products				Non-farm products	All items	Food	Industrial	Farm	
	Farm machinery	Farm wage rates	General	All		Field	Animal								
					1935-39=100						1949=100				
1947.....	170.4	126.3	125.0	341.4	215.8	163.3	192.2	184.1	200.2	160.3	84.8	79.5	91.5	100.6	
1948.....	197.6	141.6	131.3	371.2	255.8	194.3	232.1	200.6	263.7	184.9	97.0	97.5	96.4	104.9	
1949.....	204.1	158.3	138.7	373.3	255.4	196.3	238.7	191.9	265.4	190.9	100.0	100.0	100.0	110.0	
1950.....	210.4	165.1	144.3	368.7	260.8	211.2	226.7	191.9	281.4	204.2	102.9	102.6	107.3	100.4	
1951.....	230.0	186.8	151.8	416.6	296.8	240.2	288.6	200.4	336.9	233.2	113.7	117.0	117.4	122.3	
1952.....	243.1	195.4	161.4	445.5	274.4	226.0	250.2	223.0	277.5	226.0	116.5	116.8	122.4	140.0	
1953.....	239.3	196.7	168.2	449.1	250.4	220.7	221.6	179.4	273.0	223.3	115.5	112.6	131.3	130.2	
1954.....	237.2	197.9	174.6	441.2	236.8	217.0	213.6	170.9	256.3	219.6	116.2	112.2	131.1	104.0	
1955.....	238.3	198.8	177.2	439.7	232.7	218.9	212.6	180.1	245.1	225.9	116.4	112.1	145.5	127.1	
1956.....	247.6	209.4	184.7	470.3	234.6	225.6	214.2	181.6	246.9	235.7	118.1	113.4	160.7	136.5	
1957.....	255.9	223.8	191.9	501.4	234.2	227.4	212.3	169.2	258.0	236.0	121.9	118.6	163.3	117.0	
1958.....	259.9	236.1	196.7	513.2	245.5	227.8	222.9	171.4	274.5	233.0	125.1	122.1	162.4	128.2	
1959.....	269.5	247.8	204.7	538.2	247.4	230.6	223.9	176.1	271.6	236.0	126.5	121.1	176.5	127.3	
1960.....	276.7	253.5	214.5	555.3	250.0	230.9	226.6	189.1	264.1	237.0	128.0	122.2	179.8	133.7	
1961.....	282.2	260.7	220.6	566.0	261.2	233.3	230.9	191.7	270.0	239.1	129.2	124.0	186.2	116.1	
1962.....	290.7	268.1	228.0	576.1	272.0	240.0	240.8	195.5	286.0	244.8	130.7	126.2	201.7	147.6	
1963.....	298.6	272.9	239.1	600.6	268.4	244.6	236.3	197.2	275.4	248.0	133.0	130.3	215.3	162.0	
1964.....	308.6	279.6	247.4	627.5	265.8	245.4	232.7	198.2	267.3	252.2	135.4	132.4	235.3	150.9	
1965.....	321.8	284.9	259.1	677.0	282.2	250.4	249.8	210.3	289.3	257.2	138.7	135.9	254.9	162.0	
1966.....	343.2	293.1	272.2	764.4	297.2	259.5	258.7	195.8	321.5	262.5	143.9	144.5	275.1	182.8	
1966															
August.....	349.0	293.9	272.2	789.4	280.6	260.4	244.8	170.9	318.6	263.5	144.9	148.1	264.1	—	
September.....	—	—	—	—	282.6	260.7	245.5	169.8	321.2	263.7	145.1	147.1	280.6	—	
October.....	—	—	—	—	287.7	260.3	247.7	171.7	323.7	263.2	145.3	145.6	287.2	—	
November.....	—	—	—	—	286.8	260.3	247.0	172.1	321.9	264.0	145.5	144.7	291.3	—	
December.....	—	—	—	—	287.8	261.0	249.2	172.9	325.5	263.7	145.9	144.7	276.0	—	
1967															
January.....	351.5	301.6	272.2	788.4	287.4	261.5	249.7	175.3	324.1	264.9	146.0	144.9	272.0	—	
February.....	—	—	—	—	288.4	262.6	248.3	173.8	322.9	266.2	146.1	144.1	281.2	—	
March.....	—	—	—	—	286.7	262.0	243.9	170.2	315.1	266.6	146.5	143.3	279.3	—	
April.....	367.5	302.8	272.2	873.3	284.2	262.0	245.0	172.7	319.9	267.0	147.8	144.0	283.9	—	
May.....	—	—	—	—	286.1	263.2	249.6	171.4	327.8	267.2	148.1	143.7	289.1	—	
June.....	—	—	—	—	290.1	263.6	251.9	173.4	330.4	267.2	148.8	144.8	289.1	—	
July.....	—	—	—	—	286.8	263.7	250.1	175.2	325.0	268.6	150.2	148.5	261.5	—	
August.....	367.1	302.1	272.2	865.6	288.5	264.6	250.4	180.9	329.8	269.4	150.9	151.2	274.4	—	
September.....	—	—	—	—	288.0	264.7	258.6	186.0	331.2	270.4	150.7	148.5	290.4	—	
October.....	—	—	—	—	297.1	265.1	258.9	186.8	330.9	271.0	151.0	147.8	290.1	—	
November.....	—	—	—	—	294.3	264.9	254.6	186.1	323.1	271.8	150.5	148.0	—	—	
December.....	—	—	—	—	295.3	266.8	256.3	186.2	326.4	274.0	151.8	148.6	—	—	

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CANADA
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SELECTED INDEXES: FARM COSTS, FARM PRICES, WHOLESALE PRICES, CONSUMER PRICES, PRODUCTION

(All indexes shown are official, seasonally unadjusted indexes published by the Dominion Bureau of Statistics.)

Year	Index of Prices Paid by Farmers					Index of Prices Received by Farmers		Wholesale Price Indexes				Consumer Price Indexes			Production Price Indexes		
	Composite (excluding living machinery costs)	Taxes and interest rates		Farm wage rates	Farm machinery	Prices Received by Farmers	Canadian Farm Products				Non-farm products	All items	Food	Industrial	Farm		
		Farm interest rates	Farm machinery				General			Animal							
							All	Field	Animal								
	1935-39=100	1961=100	1935-39=100	1961=100	1935-39=100	1961=100	All	Field	Animal								
1948	197.6	141.6	131.3	371.2	99.1	194.3	232.1	200.6	263.7	184.9	75.1	78.6	51.5	104.9	100		
1949	204.1	158.3	138.7	373.3	98.9	198.3	228.7	191.9	265.4	190.9	77.4	80.6	53.4	100.0	100		
1950	210.4	165.1	144.3	368.7	101.0	211.2	236.7	191.9	281.4	204.2	79.6	82.7	57.3	110.4	100		
1951	230.0	186.8	151.8	416.6	115.0	240.2	268.6	200.4	336.9	233.2	83.0	94.4	62.7	122.3	100		
1952	243.1	195.4	161.4	445.5	106.3	226.0	250.2	223.0	277.5	226.0	90.2	94.2	65.3	140.0	100		
1953	239.8	196.7	168.2	449.1	97.0	220.7	221.6	179.4	263.8	223.3	89.4	90.8	70.1	130.2	100		
1954	237.2	197.9	171.6	441.2	91.7	217.0	213.6	170.9	256.3	219.6	89.9	90.5	70.0	104.0	100		
1955	238.3	198.8	177.2	439.7	90.1	218.9	212.6	180.1	245.1	225.9	90.1	90.4	77.7	127.1	100		
1956	239.4	200.4	184.7	470.3	90.9	225.6	214.2	181.6	246.9	235.7	91.4	91.4	85.8	136.5	100		
1957	255.9	223.8	191.9	501.4	91.2	227.4	213.6	169.2	258.0	236.0	94.3	95.6	87.2	117.0	100		
1958	259.9	236.1	196.7	513.2	95.2	227.8	222.9	171.4	274.5	233.0	96.8	98.5	86.7	128.2	100		
1959	269.5	247.8	204.7	538.2	95.2	230.6	223.9	176.1	271.6	236.0	97.9	97.7	94.2	133.9	100		
1960	276.7	253.5	214.5	555.3	96.1	230.9	226.6	189.1	264.1	237.0	99.1	98.5	96.2	133.9	100		
1961	282.2	260.7	220.6	566.0	100.0	233.3	230.9	191.7	270.0	239.1	100.0	100.0	100.0	116.2	100		
1962	290.7	268.1	228.0	576.1	104.3	240.0	240.8	195.5	286.0	244.8	101.2	101.8	109.5	148.2	100		
1963	298.6	272.9	239.1	700.6	102.9	244.6	236.3	197.2	275.4	248.0	103.0	105.1	116.5	162.6	100		
1964	308.6	279.6	247.4	727.5	101.3	245.4	232.7	198.2	267.3	252.2	104.8	106.8	128.1	151.2	100		
1965	321.8	284.9	259.1	777.0	107.8	250.4	249.8	210.3	289.3	257.2	107.4	109.6	139.1	162.1	100		
1966	343.2	293.1	272.2	842.7	117.0	259.5	265.6	209.7	321.5	262.5	111.4	116.6	148.9	183.3	100		
1967	365.3	302.2	288.1	842.7	116.0	264.1	262.0	198.7	325.3	269.0	115.4	118.1	151.7	158.9	100		
1968	387.3	313.7	306.3	920.9	113.7	269.9	257.8	186.3	329.3	278.2	120.1	122.0	159.8	173.3	100		
1968	371.4	313.0	306.3	835.7	112.7	267.2	253.0	189.6	316.3	275.6	118.1	121.3	151.0	—	—		
January	371.4	313.0	306.3	835.7	112.7	267.2	253.0	189.6	316.3	275.6	118.1	121.3	151.0	—	—		
February	371.4	313.0	306.3	835.7	112.7	267.2	253.0	189.6	316.3	275.6	118.1	121.3	151.0	—	—		
March	371.4	313.0	306.3	835.7	112.7	267.2	253.0	189.6	316.3	275.6	118.1	121.3	151.0	—	—		
April	392.6	313.5	306.3	948.8	112.5	268.3	249.0	185.1	312.9	277.8	118.6	119.9	150.4	—	—		
May	392.6	313.5	306.3	948.8	112.5	268.3	249.0	185.1	312.9	277.8	118.6	119.9	150.4	—	—		
June	392.6	313.5	306.3	948.8	112.5	268.3	249.0	185.1	312.9	277.8	118.6	119.9	150.4	—	—		
July	392.6	313.5	306.3	948.8	112.5	268.3	249.0	185.1	312.9	277.8	118.6	119.9	150.4	—	—		
August	398.0	314.5	306.3	978.3	115.0	270.0	265.0	189.2	330.1	276.9	120.4	122.5	153.3	—	—		
September	398.0	314.5	306.3	978.3	115.0	270.0	265.0	189.2	330.1	276.9	120.4	122.5	153.3	—	—		
October	398.0	314.5	306.3	978.3	115.0	270.0	265.0	189.2	330.1	276.9	120.4	122.5	153.3	—	—		
November	398.0	314.5	306.3	978.3	115.0	270.0	265.0	189.2	330.1	276.9	120.4	122.5	153.3	—	—		
December	398.0	314.5	306.3	978.3	115.0	270.0	265.0	189.2	330.1	276.9	120.4	122.5	153.3	—	—		
1969	393.6	320.2	306.3	939.5	112.4	278.1	264.2	185.4	343.0	285.5	122.6	125.1	162.0	—	—		
January	393.6	320.2	306.3	939.5	112.4	278.1	264.2	185.4	343.0	285.5	122.6	125.1	162.0	—	—		
February	393.6	320.2	306.3	939.5	112.4	278.1	264.2	185.4	343.0	285.5	122.6	125.1	162.0	—	—		
March	393.6	320.2	306.3	939.5	112.4	278.1	264.2	185.4	343.0	285.5	122.6	125.1	162.0	—	—		
April	411.1	325.9	306.3	1,026.9	113.4	282.2	268.3	183.0	353.7	290.0	124.6	125.0	168.5	—	—		
May	411.1	325.9	306.3	1,026.9	113.4	282.2	268.3	183.0	353.7	290.0	124.6	125.0	168.5	—	—		
June	411.1	325.9	306.3	1,026.9	113.4	282.2	268.3	183.0	353.7	290.0	124.6	125.0	168.5	—	—		
July	411.1	325.9	306.3	1,026.9	113.4	282.2	268.3	183.0	353.7	290.0	124.6	125.0	168.5	—	—		
August	410.7	326.3	306.3	1,037.2	115.8	282.4	275.0	188.2	361.7	286.0	126.4	126.9	159.4	—	—		
September	410.7	326.3	306.3	1,037.2	115.8	282.4	275.0	188.2	361.7	286.0	126.4	126.9	159.4	—	—		
October	410.7	326.3	306.3	1,037.2	115.8	282.4	275.0	188.2	361.7	286.0	126.4	126.9	159.4	—	—		
November	410.7	326.3	306.3	1,037.2	115.8	282.4	275.0	188.2	361.7	286.0	126.4	126.9	159.4	—	—		
December	410.7	326.3	306.3	1,037.2	115.8	282.4	275.0	188.2	361.7	286.0	126.4	126.9	159.4	—	—		

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